



THE ASSAM GAZETTE

অসাধাৰণ

EXTRAORDINARY

প্ৰাপ্ত কৰ্তৃত্ব দ্বাৰা প্ৰকাশিত

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No. 175 Dispur, Saturday, 30th March, 2024, 10th Chaitra, 1946 (S. E.)

GOVERNMENT OF ASSAM

ORDERS BY THE GOVERNOR

DEPARTMENT OF HOUSING AND URBAN AFFAIRS

NOTIFICATION

The 25th May, 2023

ECF No. 303311/2023/123.- In exercise of the powers conferred by the section 9 and Sub-Section (1) of Section 10 of the Assam Town & Country Planning Act. 1959 (as amended) read with sub-rule (1) of Rules 3 of the Assam Town and Country Planning (Publication of Master Plan and Zoning Regulations) Rules 1962, the Governor of Assam is pleased to publish the following notice regarding the publication of Draft Master Plan for Golakganj-2041.

NOTICE FOR THE PUBLICATION OF DRAFT MASTER PLAN FOR GOLAKGANJ- 2041

1. It is notified that the Draft Master plan for Golakganj prepared by the Directorate of Town & Country Planning, Assam, under section 9 of the Assam Town & Country Planning Act. 1959 (As amended), as described in the schedule below is hereby published.
2. Any person or persons affected by the Draft Master plan may submit their objection or opinion in writing to the Director, Town & Country Planning, Dispur, Guwahati-6 within two months from the date of publication.
3. The Draft Master plan for Golakganj with all relevant papers and maps may be inspected free of cost during office hours at the Office the Director, Town & Country Planning, Assam, Dispur, Guwahati-6, the Deputy Director, Town & Country Planning, District Office- Dhubri, the Circle Office, Golakganj Revenue Circle, Golakganj, Office of the Chairman, Golakganj Municipal Board, Golakganj, Copies of the Draft Master plan for Golakganj are available at the office of the Deputy Director, Town & Country Planning, Dhubri for sale on payment.

SCHEDULE

1) Situation and Area

District : Dhubri
 Sub-Division : Golakganj
 Area covered by Master Plan : 20.00 Sq. Kms.
 Golakganj Municipal Area : 5.00 Sq. Kms.

2) Towns and Villages including in the Draft Master Plan for Golakganj Master Plan Area

S.No.	Name of Towns/Villages	Category	S.No.	Name of Towns/Villages	Category
Golakganj Municipal Board Area			Rural Area		
1	Ward 1	Urban	1	Dakhin Tokererchara Pt.I	Village
2	Ward 2	Urban	2	Dakhin Raipur Pt. I	Village
3	Ward 3	Urban	3	Dakhin Raipur Pt. II	Village
4	Ward 4	Urban	4	Dakhin Raipur Pt. III	Village
5	Ward 5	Urban	5	Uttar Raipur Pt. I	Village
6	Ward 6	Urban	6	Pub Gaikhowa Pt. I	Village
7	Ward 7	Urban	7	Pub Gaikhowa Pt. II	Village
8	Ward 8	Urban	8	Paschim Konuri Pt. I	Village
9	Ward 9	Urban	9	Paschim Konuri Pt. II	Village
10	Ward 10	Urban			Village

DESCRIPTION OF GOLAKGANJ MASTER PLAN BOUNDARIES

East : Brahmattar, Jawarimari
 North : Cooch Behar District, West Bengal
 West : International Border, Bangladesh
 South : Lakhimari, Dimakuri Pt. I and Salundanga.

KAVITHA PADMANABHAN,
 Commissioner & Secretary to the Government of Assam,
 Department of Housing and Urban Affairs.

Chapter 1. Introduction to Master Plan Area

A master plan is a dynamic long-term planning document that provides a conceptual layout to guide future growth and development. Master planning is about making the connection between buildings, social settings, and their surrounding environments. A master plan includes analysis, recommendations, and proposals for a site's population, economy, housing, transportation, community facilities, and land use. It is based on public input, surveys, planning initiatives, existing development, physical characteristics, and social and economic conditions.

Master planning can assume some or all of these roles:

- Develop a phasing and implementation schedule and identify priorities for action
- Act as a framework for regeneration and attract private sector investment
- Conceptualize and shape the three-dimensional urban environment
- Define public, semiprivate, and private spaces and public amenities
- Determine the mix of uses and their physical relationship
- Engage the local community and act as builder of consensus

It is important to consider the master plan as a dynamic document that can be altered based on changing project conditions over time. The flexibility in the master plan is beneficial to the real estate sector, enabling increases in the number of floors and housing units per building. Master plans can have an important role in determining the shape of the urban environment. If not well conceived, they can lead to problems in the future.

1.1 Approach and Methodology

Approach Adopted for the Project

The prime objective of a Master Plan is to create a sustainable environment that in turn is a combination of various factors. Therefore, the basic approach adopted in preparation of the Plan is to create a balance between the natural, economic and social environment including infrastructure requirements, responsive use of natural resources and sensitive areas, protection of heritage and also address the safety and security concerns of the citizens. The GIS based Master Plan for Golakganj require a comprehensive approach that is capable of addressing infrastructure demand,

effective land-use management and utilization, spatial growth management, enable project planning, and urban management. It needs to look at all aspect of planning and implementation of projects that will ensure long term sustainability for the project area and the state using the GIS enabled technology and solutions. Our approach adopted for the Master Plan of Golakganj is based on this understanding of the project background and the need of the area. The comprehensive approach is guided by the four key pillar:

- Promoting a sustainable development through GIS-based Master Plan
- Following Integrated and holistic urban planning process
- Ensuring public participation and encouraging accountability and transparency
- Strengthening of the economic potential of the area by enriching its local capabilities

These key pillars will guide in preparing the Master Plan for the Golakganj area. The project is designed to achieve this by addressing the project structure and defined deliverables. Through the project formulation and implementation process key areas that is expected to be addressed are:

- Allocating the use of land for purposes such as residential, industrial, commercial, agriculture, recreational and other uses
- Designation of areas for public and semi-public spaces
- Transportation requirements
- Assess the requirement in public utilities, amenities and facilities
- Identify areas for preservation, conservation and development
- Proposal for circulation plan
- Proposals for planning standards and zoning regulations

The project output will be shared with and make provision for public participation to understand the urban development plan for Golakganj area. This process will enable identifying the infrastructure need, build capacity of the government agencies, and operationalize the implementation of the plan. The consultant team will:

- Collect all the data required in support of the department for the preparation for the master plan

- Conduct Land Use survey and traffic survey for the preparation of existing land use survey and for identification of transportation requirements
- Prepare reports for all the deliverables
- Conduct consultations with the team and the local community and stakeholders.
- Work closely with the client to coordinate with line departments for knowledge sharing with the public

Methodology

This project is expected to be delivered within a time frame of 45 days. A fast paced and tight timeline project requires a clear project implementation plan to guide the team, the technical tasks, and the effective delivery on expectations. The methodology is being prepared considering the scope of work and the time frame given for the preparation of master plan. The various tasks considered would ensure timely completing and would also ensure it is prepared considering the opinion and view point of all the stakeholders. Outlined below are key elements of our implementation methodology.

From the methodology flow chart, it can be seen that the project will start with Meeting with the client and discussing with them about the project area and gaining some insight from them about the project.

- Collection of Cadastral Map for the Project Area from the Circle Office. Georeferencing of the Cadastral Map for finalization of the master plan area after discussion with the client.
- Preparation of the base map of the area using earth imagery after the master plan area is finalized. Digitization of the cadastral map of the master plan area.
- Data Collection from various department with support of the client after finalization of the data to be collected as per discussion with the client.
- Carrying out of Land Use Survey and Traffic Survey in both the Master Plan Area.

The technique used for the land use survey is that the whole area has been divided into grids and map of these grids are printed and field visit are carried out taking these sheets and land use is being marked on these after ground verification and further Geotagging of Public and Semi-Public Building and Utility services is also carried out.

For Traffic Survey hierarchy of road is being made by measuring width of various road and identifying their types (Bituminous Road, Cement Block Road, and Earth Road). Further, important cross section will be identified and traffic volume survey would be carried out.

- Updation of the survey details over the base map for the preparation of the existing land use map and utility map.
- Submission of the Existing Land Use map as first deliverable. Preparation of existing situation analysis report using the Census 2011 data of the project area and identification of the key issues and potential area for development
- Carrying out demand and gap analysis for current and future requirement based on the projection of the population for 2041 of the master plan area.
- Conducting stakeholders meeting for discussion of the various proposals and finalization of the proposed land use and circulation plan for the master plan area.
- Preparation of Draft Master Plan Report comprising of Proposed Land Use, Zoning Controls, Circulation Network and Utility Map and also identification of various project which can be developed in a Phase wise manner for developing the economic potential of the area and would lead to improved living standards.

The consultant would incorporate the changes and suggestion provided by the client and other stakeholders and would submit the Final Master Plan Report.

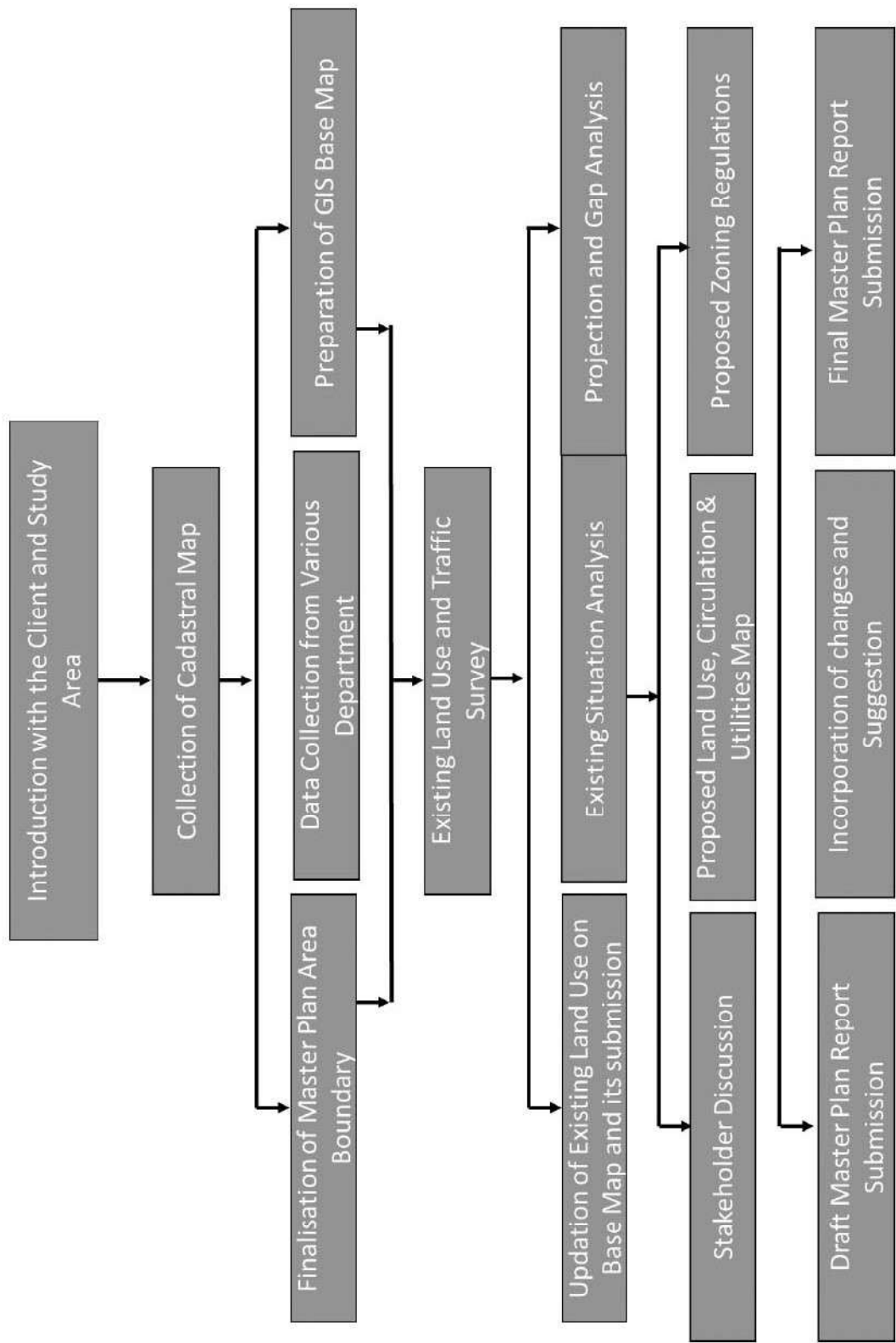


Fig. No. 1-1: Methodology Flowchart
Source: Author

Chapter 2. Project Area Profile

The master plan area of Golakganj comprises of Town area under the Golakganj Municipal Board Area and nearby villages close to the Golakganj town. The total planning area (urban-rural) of Master Plan is around 20 sq.km. The master plan area consists of Golakganj Census Town and 11 villages from Golakganj and Agomani Circle. Blow are the list of villages and town proposed for the master plan area of Golakganj:

Table 2-1: List of rural and urban areas in Golakganj

S.No.	Name of Village/ Town	Category
Golakganj Municipal Board		
1	Ward 1	Urban
2	Ward 2	Urban
3	Ward 3	Urban
4	Ward 4	Urban
5	Ward 5	Urban
6	Ward 6	Urban
7	Ward 7	Urban
8	Ward 8	Urban
9	Ward 9	Urban
10	Ward 10	Urban
Rural Area		
1	Dakhin Tokererchara Pt. I	Village
2	Dakhin Raipur Pt. I	Village
3	Dakhin Raipur Pt. II	Village
4	Dakhin Raipur Pt. III	Village
5	Uttar Raipur Pt. I	Village
6	Pub Gaikhowa Pt. I	Village
7	Pub Gaikhowa Pt. II	Village
8	Paschim Konuri Pt. I	Village
9	Paschim Konuri Pt. II	Village

Source: Census, 2011

2.1 Location, regional setting, brief history of the town and surrounding

Golokganj (also spelt as Golakganj or Galakganj) is a census town in Dhubri district in the Indian state of Assam. Golakganj is one of the historical places of Dhubri district. Golakganj is located at 26.10°N 89.83°E. Golakganj is situated 20 km from the district headquarters. Golakganj is situated on the east bank of Gangadhar River and the

Indo-Bangladesh border is almost 5 km. away from heart of the place. Golakganj is the prime commercial place of its adjacent towns and villages Further the area is around 30 kms from the border of the West Bengal state. The soil of this place is very fertile.

2.2 Brief History

Golakganj is census town of Dhubri district and history of Golakganj hails from the history of Dhubri. Dhubri District - the gateway of western Assam in the past was a meeting place of different racial groups which mingled together and formed a unique Cultural Heritage and Historical Background. The growth of blended culture in this region, particularly in the areas of language, art and religion is due to the continuous process of assimilation of various races, castes, and creeds of local people, invaders, and migrated people. Dhubri District is bounded both by inter-state and international border i.e., West Bengal and Bangladesh in the west, Goalpara and Bongaigaon district of Assam and Garo Hills district of Meghalaya in the east, Kokrajhar district in the north, Bangladesh and state of Meghalaya in the south.

2.3 Climate, topography and soil condition

The climate of Golakganj is almost similar to that of the other towns of Assam. It experiences fairly a moderate climate throughout the year. The winter season comes at the end of November when both night and day temperature being to fall gradually. The average daily maximum temperature in the month varies between 22.53 degree centigrade. The lowest temperature in the night hour in the month generally does not go below 16 degrees centigrade. December and January are the coldest months of Golakganj when the mean daily maximum temperature goes below 10.42 degree centigrade.

The planning area is mainly consisting of fertile alluvial soil. The general characteristic of the soil is acidic. There has been no major discovery of mineral deposits in the area as per survey conducted by the Department of Geology and Mining. General topography of the area is plain and has an average elevation of 45 m (148 ft).

2.4 City influence

The Golakganj master plan area act as a saddle across the Gangadhar River. The town is located on east of the Gangadhar river in an area of about 3.5 sqkm and the

town area is growing along the major road which is diverging from the national highway. Most of the government institutions and commercial area is along this major road. Golakganj Municipal Board has been established recently in 2022 for the development and implementation of the various government schemes and its monitoring.

The area has grown over a period of time. The figure below shows the growth of the master plan in the last decade. From the figure below, it can be seen that the growth of the master plan area is mainly concentrated in the town area and the town has grown radially. In 2010 the bridge crossing the Gangadhar River was not built and therefore the growth across the Gangadhar River was very low only railway was the only means of travel.

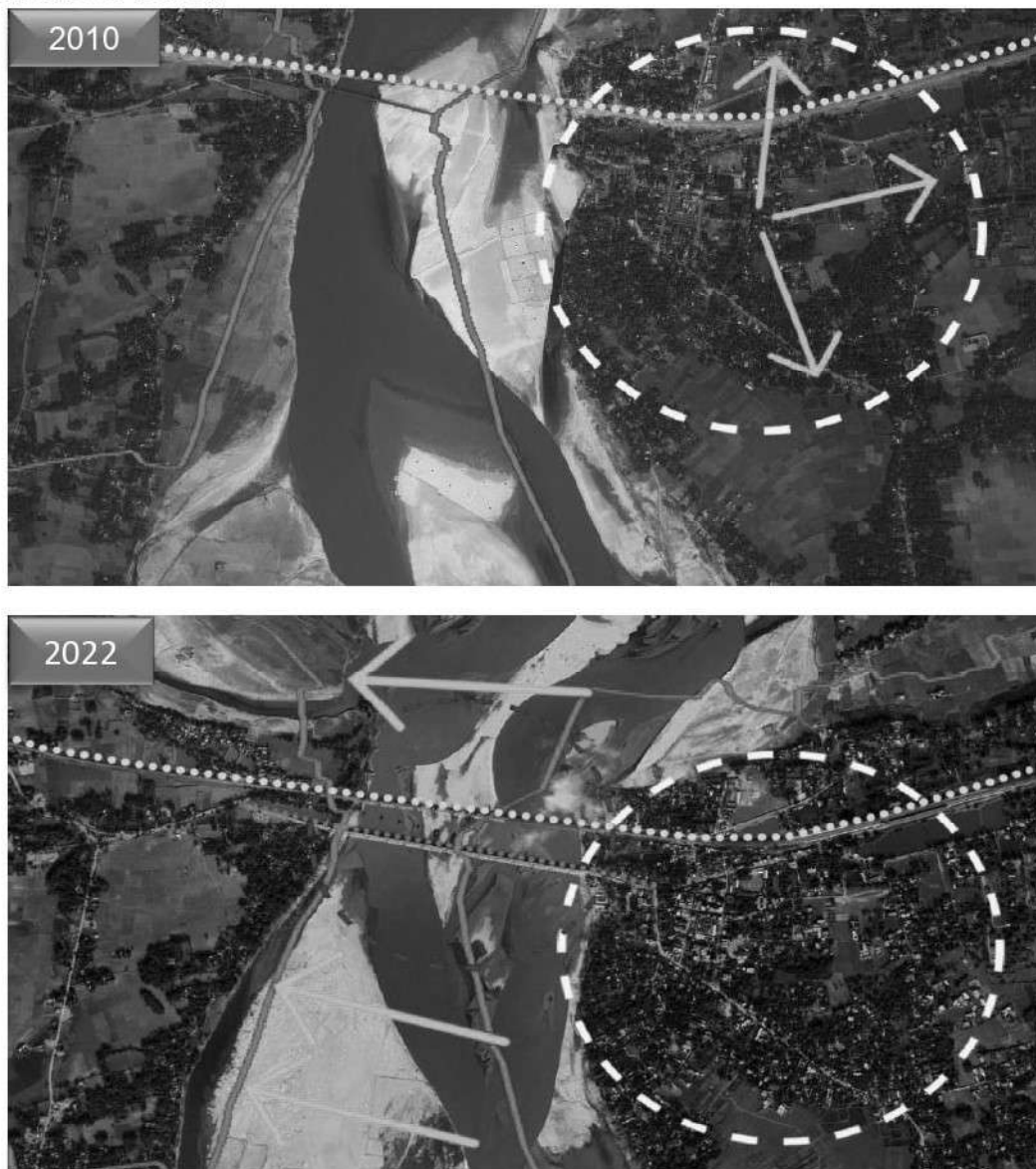


Fig. No. 2-1: Figure showing evolution of city and its influence

Source: Author

Whereas in 2022 it can be seen that the growth of the master plan area has started across the river also and the growth in the town area has also expanded. With the preparation of the master plan this growth could be organized in a planned way with all the facilities and growth in economic activity and have sustainable development.

2.5 Need for the Master Plan

The scope of a master plan confines to the broad proposals and allocation of land for various uses such as residential, industrial, commercial, recreational, public and semi-public, etc. It proposes a network of roads and pattern of streets and traffic circulation systems for the present and the future. A master plan identifies areas required to be preserved and conserved and development of areas of natural scenery and landscape together with preservation of features, structures or places of historical, architectural and scientific interest and environmental value. Master plan includes zoning regulations for regulating development within each zone. It also indicates stages through which the plan is proposed to be implemented. Thus, a master plan is an important instrument for guiding and regulating development of towns and cities over a period of time, and contributes to planned development both conceptually and operationally.

Chapter 3. Demography

The analysis for different socio-economic parameters has been done at village level. The total planning area (urban-rural) of Master Plan is around 20 sq.km. The master plan area consists of Golakganj Census Town and 11 villages from Golakganj and Agomani Circle.

3.1 Demographic Profile

The master plan area has a total population of 17.76 thousand as per 1991 census which rose to 25.56 thousand in 2001 with a growth percentage of 44% in the decade and in 2011 the population rose to 26.65 thousand with a meagre growth rate of 4% only in the decade. This could be attributed to the negative growth rate of the population of the municipal area which is (-10%) in the last decade. The growth in the rural area was around 23% in the last decade as per census 2011. The negative growth rate in the town could be because of outmigration by the people for employment and educational opportunities.

Table 3-1 Demographic Detail of Master Plan

Year	Municipal Board Area	Growth Rate (%)	Rural Area	Growth Rate (%)	Master Plan Area	Growth Rate (%)
1991	9227		8542		17769	
2001	14464	57%	11101	30%	25565	44%
2011	13020	-10%	13637	23%	26657	4%

Source: Census, India

3.2 Household Size

The average household size of master plan area is around 4.5 as per census 2011, which reduced from 5.2 in 2001 and 5.6 in 1991 which is approximately equal to the household size of Dhubri District which is 4.7 as per census 2011. The percentage share of male and female population is around 52 and 48 percent respectively and approximately the same pattern is seen in the census 2001 and 1991.

Table 3-2: Demographic statistics of Golakganj

Year	HHs Size	Male (%)	Female (%)
1991	5.6	51%	49%
2001	5.2	51%	49%
2011	4.5	52%	48%

Source: Census, India

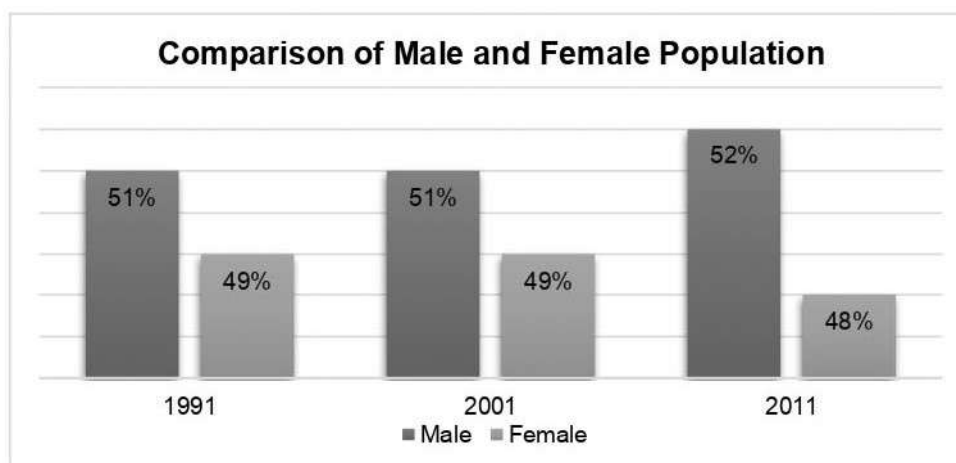


Fig. No. 3-1: Decade Wise Comparison of Male and Female Population
Source: Census 2011

3.3 Literacy Rate

According to the 2011 census, the literacy rate in Dhubri District is 47% percent which is a very low percentage in comparison to the national average of 74%, whereas the Master Plan area has a literacy rate of 64% in 2011 which has increased around 13% percent from 2001 as it was just 51% in 2001. The literacy rate of the district and the master plan is relatively low as per the national average which indicates a lower standard of education and the poor ability of the population to find formal employment.

Table 3-3: Table showing literacy rate of Golakganj

Year	Population Literate	Population Literate (%)	Male Literate Pop	Male Literate Pop (%)	Female Literate Pop	Female Literate Pop (%)
1991	7988	45%	4877	61%	3111	39%
2001	13046	51%	7724	59%	5322	41%
2011	16978	64%	9452	56%	7526	44%

Source: Census, 2011

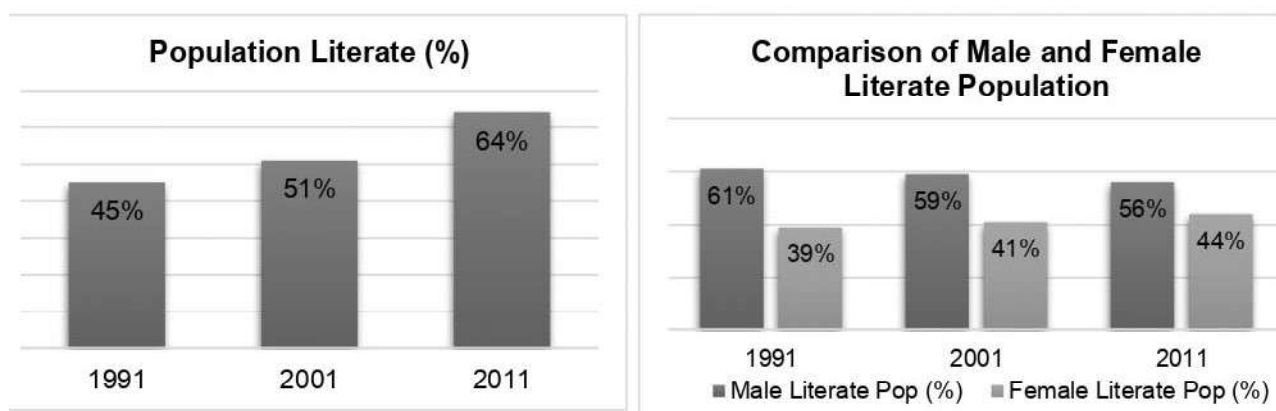


Fig. No. 3-2: Literate Population and Comparison of Male and Female Literacy
Source: Census 2011

Further from the table, it can be inferred that the literate population and female literacy rate has increased from 45% and 39 % respectively in 1991 to 64% and 44% in 2011 which shows there is improvement in education facilities and equal opportunity is given to both female and male for education.

During the field survey, it was discovered that almost all of the villages have Anganwadi and lower primary schools nearby, which would suffice for the children's initial education.

3.4 Sex Ratio

The sex ratio of Dhubri District is 953 as per census 2011 and whereas sex ratio for master plan area is around 941 which is approximately equal to the sex ratio for nation which is 943 as per Census 2011. From the table it can be seen that the sex ratio has declined the two decades from 951 to 941.

Table 3-4: Table showing sex ratio of Golakganj

Year	Sex Ratio
1991	951
2001	944
2011	941

Source: Census, 2011

3.5 Population Projection

Population is the most important factor which is directly related to the various needs of the area. The prime objective of any Master Plan is to assess the present situation and project the future population for plan period, and accordingly calculate the requirements of both physical and social infrastructure in order to cater to the needs of such population. Therefore, population projection is the basic requirement for the projection of other needs of the area. From all these projections, the developmental plan of an area should be prepared which can fulfil the different needs of the people living therein.

To arrive at a conclusive projection figure, three methods of population projections have been used for the whole Master Plan Area. The methods used for projecting population are:

Table 3-5 Population Projection for Golakganj Master Plan Area using various Methods

Year	Category	2021	2026	2031	2036	2041
Arithmetic	Rural	16185	17458	18732	20006	21279
	Municipal	14917	15865	16813	17761	18710
	Total	31102	33323	35545	37767	39989
Geometric	Rural	17400	19746	22467	25622	29283
	Municipal	15403	16777	18291	19963	21811
	Total	32802	36522	40758	45586	51094
Compounded Annual Growth	Rural	17755	20350	23383	26927	31071
	Municipal	15721	17322	19124	21158	23462
	Total	33476	37672	42507	48085	54532

Source: Author

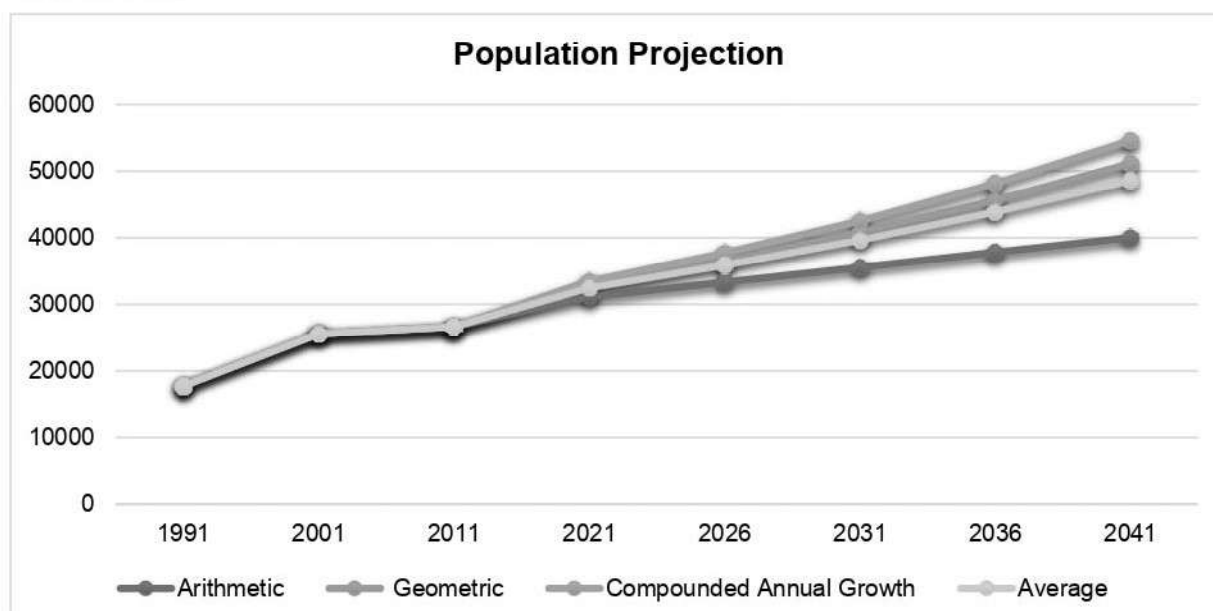


Fig. No. 3-3: Population Projection

Source: Author

Considering the three types of population projection methods, the most conservative figures have been arrived at vide the Arithmetic Progression Method, showing a population of 39,989 by 2041. Since the Golakganj town is still one of the smaller towns of Assam, with no major economic and commercial activities in the anvil, the conservative projection figure of 39,989 persons shall be considered for the purpose of planning for the horizon population.

Chapter 4. Economic Base and Employment

Economic Base constitutes businesses that generate employment in a community or a geographical area and all the major industries within a geographic market area that provide employment opportunities essential to support the community. Information about an area's future population is incomplete without a parallel understanding of the local economy that largely shapes its future.

Golakganj is largely an agricultural town, with presence of few cottage, small and medium industries. Golakganj falls in the alluvial plains of the Gangadhar river and thus is historically characterized by primary activities, mainly agriculture.

Table 4-1: Table showing economic activities of Golakganj

Sectors	Economic Activities	Economic Activities Found in Golakganj
Primary	Agriculture, horticulture & forestry, Sericulture & fishing, mining and quarrying, animal husbandry and dairy	Paddy, rice, vegetables, mustard, bamboo
Secondary	Manufacturing, construction, Household industries	Clay, Sculpture painting, rice mill and bamboo products
Tertiary	Trade, tourism, hotel & restaurants, transport storage & communication, banking, public administration and informal sector	Sub-divisional offices, commercial banks, colleges

Source: Census 2011

The major agriculture product grown in the villages are paddy, jute, mustard, wheat, seasonal vegetables and fruits, further these products are processed into manufactured commodities like mustard oil, rice, wheat flour, wood oil, banana products etc. The same has been mentioned in the table below.

Table 4-2: Various Agricultural and Manufactured Commodities

Agricultural Commodities	Manufacturers Commodities	Agricultural Commodities	Manufacturers Commodities
Paddy	Rice	Mustard seed	Mustard oil
Jute	Jute	Banana	Banana product
Wheat	Wheat		Aluminium
Water melon			Wood Oil

Source: Census 2011

4.1 Workforce Participation Rate

The workforce classification as per the Census shows a very grim picture. Only 33% of the total population is working in the master plan area. Around 5% change in the percentage of working population took from 1991 to 2011.

Table 4-3: Workforce characteristics of Golakganj

Year	Working Pop	Working Pop (%)	Male Working Pop	Male Working Pop (%)	Female Working Pop	Female Working Pop (%)
1991	5064	28%	4489	89%	575	11%
2001	8083	32%	6650	82%	1433	18%
2011	8900	33%	7581	85%	1319	15%

Source: Census of India

Among the working population the share of male and female working population shows high gender disparity with female share in working population is around 15% of the total working population. This shows that the females are mainly engaged in household chores and only males in the family are the sole breadwinner for most of the households.

4.2 Classification of Working Population

The working population is divided into main worker and marginal worker population. As per the project area 86% of the working population work as main worker and 14% work as marginal worker as per census 2011. In 2001 the percentage was 95% and 5% respectively which shows the growth in the main worker population has decreased because the population growth is very low which can be attributed to outmigration for better education and employment opportunities. The higher percentage of main worker shows that the employment is continuous for most of the working population.

Table 4-4: Workforce classification at Golakganj

Year	Main Worker Pop	Main Worker Pop (%)	Marginal Worker Pop	Marginal Worker Pop (%)
1991	4758	94%	306	6%
2001	7645	95%	438	5%
2011	7664	86%	1236	14%

Source: Census of India

The main and marginal working population is divided into categories like cultivators, agricultural labourers, household industry workers and other workers. The cultivators

and agricultural labourers are considered in primary sector, household industry workers are considered in secondary sector and other workers are considered in tertiary sector. Below table give the information about the number and percentage of population employed in different sectors and in different category.

Table 4-5: Workers' category in Golakganj

Sector	Worker Category	1991		2001		2011	
Primary	Cultivators	1110	48%	1456	36%	1682	46%
	Agricultural Labourers	1196	52%	2593	64%	1974	54%
Primary Total		2306	47%	4049	50%	3656	41%
Secondary	Household Industries	865	17%	528	7%	652	7%
Tertiary	Other	1784	36%	3506	43%	4592	52%
Total Work Force		4955		8083		8900	

Source: Census 2011

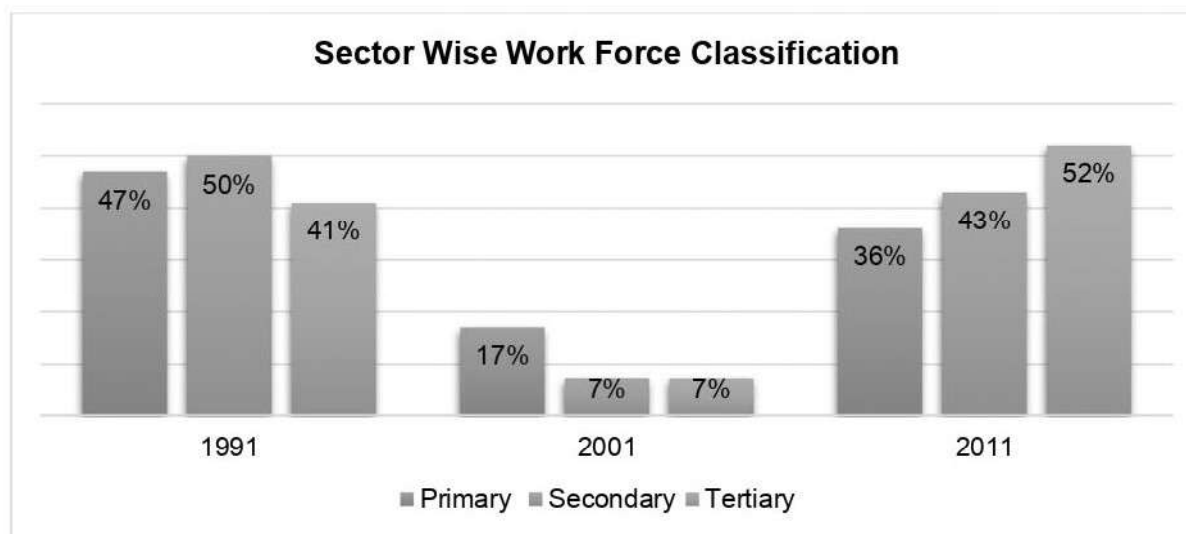


Fig. No. 4-1: Sector Wise Workforce Classification for last 3 decades

Source: Census 2011

The above table and graph clearly show that around 52% of the work force is employed in tertiary sector in 2011 which increased from 36% in 1991 which shows growth in employment in service sector this may be attributed to the various government offices in Golakganj and schemes implemented in the area. Further 41% of the population is working in Primary sector which means that the major occupation practiced in agriculture. The person employed in secondary sector is only 7% which clearly shows a smaller number of industries and household industries are prevailing in the area.

Chapter 5. Housing and Shelter

5.1 Housing

The Census of India defines a house as a building or part of a building having separate main entrance from the road or common courtyard or staircase, etc. used or recognized as a separate unit. The United Nation's Universal Declaration of Human Rights, 1948, recognizes the need of housing along with food, clothing, medical care, etc., as a right to a standard living required for health and well-being of everyone. Provision of housing is a social right, and the Government of India has been involved in providing housing to both rural and urban poor.

The Pradhan Mantri Awas Yojna-Urban (PMAY-U), a flagship mission of the Government of India for providing pucca housing to low- and middle-income groups characterizes housing as providing,

- All-weather housing unit with water, kitchen, electricity and toilet
- Women empowerment
- Better quality of life for urban poor
- Security of tenure
- Adequate physical and social infrastructure

The Government of India considers houses constructed with permanent materials to be a complete house. Thus, through its various programmes it has promoted the use of permanent materials like burnt bricks, concrete, stone slabs, etc., for the completion of walls, floors and roofs. However, in Assam, the earthquake hazard has led to the evolution of the Assam-type house which uses non-permanent materials on the walls, GI sheets for roof and concrete or mud floors, which have withstood the onslaught of the heavy rains of Assam, such houses are also easier to reconstruct if damaged during Assam's annual floods.

5.2 Types of House structure

The Census enumerates houses on their sub-classification of 5 categories: permanent, semipermanent, serviceable, non-serviceable and unclassifiable. The Census definition of the structures are as follows:

Permanent: Houses with wall and roof made of permanent materials. Wall can be made of G.I., Stone packed with Mortar, Stone not packed with Mortar, Metal, Asbestos sheets, burnt bricks, Stone or Concrete. Roof can be made of Hand-made tiles, Machine made tiles, Slate, G.I., Metal, Asbestos sheets, Brick, Stone or Concrete.

Semi-Permanent: Either wall or roof is made of permanent material while the other is made of temporary material.

Temporary: Houses with wall and roof made of temporary material. Wall can be made of Grass, Thatch, Bamboo etc., Plastic, Polythene, Mud, Unburnt brick or Wood. Roof can be made of Grass, Thatch, Bamboo, Wood, Mud, Plastic or Polythene.

- Serviceable temporary: Wall is made of Mud, Un-burnt brick or Wood.
- Non-serviceable: Wall is made of Grass, Thatch, Bamboo etc., Plastic or Polythene.

Unclassifiable: Houses not classifiable under any of the above category. In Golakganj, like the rest of Assam, there are 3 types of houses .

Kutcha House (Temporary): A house having mud floor. bamboo wall plastered with mud and thatch roof.

Assam Type (Semi pucca/Semi permanent): A house having brick wall, cement concrete or mud flooring, CGI/AC sheet roofing. Assam type houses may have any one or more of the house components (wall, roof, floor) in non-permanent material and are thus considered semi-pucca units.

Pucca House or Permanent House: A house having cement concrete flooring, brick wall and RCC slab roofing.

Table 5-1: Housing condition in Golakganj

Housing Condition		Golakganj Municipal Area	Golakganj Master Plan Area excluding the municipal Area	Total Golakganj Master Plan Area
Permanent		52%	25%	39%
Semi-Permanent		41%	66%	54%
Temporary	Serviceable	0%	0%	0%

	Non-serviceable	5%	7%	6%
Unclassifiable		1%	1%	1%

Source: Census 2011

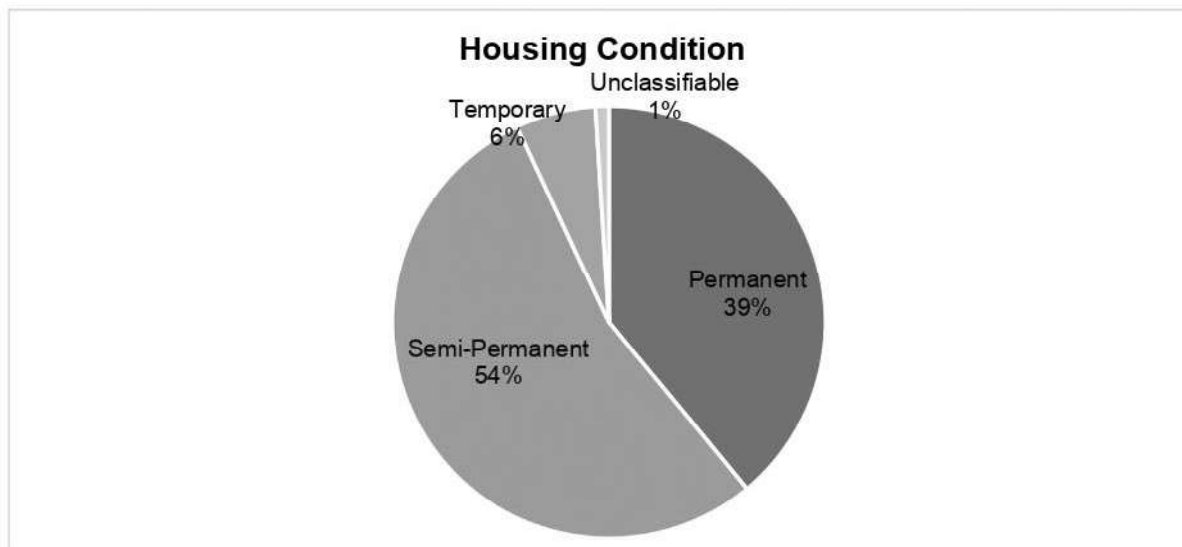


Fig. No. 5-1: Housing Condition in Golakganj

Source: Census 2011

In the Golakganj Municipal area, nearly 52 per cent of housing units are permanent, while in the extended master plan area 66 per cent are semi-permanent houses. This clearly indicates towards the desire to construct houses using fully concrete or permanent materials in the municipal area, while in the surrounding rural areas the semi-permanent structures indicating the existence of greater number of Assam-type structures which are partly made of kutcha materials —usually mud floor. Thus overall, within the Master Plan area, 54 per cent housing units are semi-permanent while 39 per cent are permanent. In the extended Master Plan area, temporary unserviceable units claim a higher share (7%) than in Golakganj town area (5%). Unserviceable temporary houses cannot provide healthy living environment to their inhabitants and are vulnerable to the vagaries of nature, especially floods and heavy rainfall.

Table 5-2: Housing Tenancy Typology in Golakganj Master Plan Area (% of Hlls)

Tenancy Status	Golakganj Municipal Area	Golakganj Master Plan Area excluding the municipal Area	Total Golakganj Master Plan Area
Owned	85%	96%	91%
Rented	9%	0%	5%
Any others	5%	3%	4%

Source Census 2011

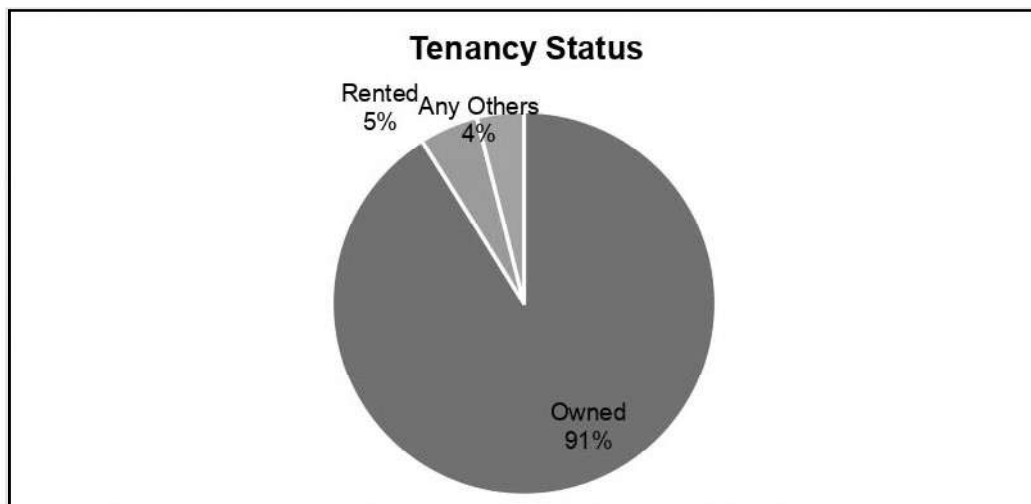


Fig. No. 5-2: Housing Tenancy Typology in Golakganj Master Plan Area (% of Hlls)
Source: Census 2011

Majority of housing units in the total Golakganj Master Plan area are owned. It's found that 92 per cent units are owned, against 5 per cent rented. Again, the trend of renting is higher in the Golakganj town with 9 per cent units rented, against only 0 per cent in the extended master plan area excluding the Golakganj town. Rented accommodation is particularly noticeable in Golakganj Municipal Area due to the presence of migrant workers and students from peripheral villages, as well as incremental migrant families from rural to more urbanized areas. The rise in rental housing indicated towards rising urbanization, as people shift to the urbanizing areas in search of job, for higher education and other opportunities. Overall, in the total planning area, 4 per cent people live in other type of housing which usually means that there is existence of hostels and guest-houses, some amount of employer housing or the practice of living in relatives' homes.

5.3 Condition of Dwelling units

Housing condition indicates the physical state of the house or dwelling unit. Census has classified dwelling units into good, livable, and dilapidated. They can be defined in the following manner:

- Those houses which do not require any repairs and are in good condition may be considered as '*Good*'.
- Those houses which require minor repairs may be considered as '*Livable*'

- Those houses which are showing signs of decay or those breaking down and require major repairs or those houses decayed or ruined and are far from being in conditions that can be restored or repaired may be considered as "Dilapidated"

The percentage distribution of households based on different housing condition in Golakganj can be understood from the following table:

Table 5-3: Structural condition of houses in Golakganj Master Plan Area. 2011(% of HHs)

Condition of Census houses as	Golakganj Municipal Area	Golakganj Master plan Area excluding the Municipal Area	Total Master Plan Area
Good	36%	21%	29%
Liveable	49%	55%	52%
Dilapidated	15%	24%	20%

Source: Census 2011



Fig. No. 5-3: Structural condition of houses in Golakganj Master Plan Area. 2011(% of HHs)

Source: Census 2011

The table and graphs above reveal that 29 per cent households in Golakganj Master Plan Area live in 'good' houses, while another 52 per cent live in 'liveable' houses. Since livable houses means houses that require only minor repairs, while, good houses require no repairs, it indicates that majority of the houses are structurally stable. In the total master plan area of Golakganj only 20 per cent houses are dilapidated. Such houses require intervention through the various housing supply schemes of the government which may be looked into through planning by the Golakganj Municipal Board and the various Panchayats, who are responsible for implementation of government funded schemes.

5.4 Housing Assessment and Gap analysis

The Housing Demand Assessment provides the background necessary to develop a comprehensive housing policy that meets the needs of current and future residents. A Housing Demand study is an analysis of the extent of the need for affordable housing in a community. The typical housing demand study has three key components:

- Current Need Analysis;
- Newly Arising Need (Demand) Analysis; and
- Supply Analysis.

Current Need Analysis

The current need analysis seeks to identify households in the community that currently lack their own housing or live in inadequate housing for a variety of reasons, and cannot afford the housing they need in the local housing market without some assistance. In simple terms, the current need analysis seeks to answer the question of who in the community needs affordable housing immediately.

Current housing scenario of Town and Villages in the master plan area is done below based on the existing condition of housing in 2011, followed by demand-gap analysis. For housing analysis 2011 is considered as a base year which has an average household size of 4.5 and consider that household size will remain same for horizon year.

Table 5-4: Housing need for base year-2011

Area	Population - 2011	Available Household	Demand	Shortfall/ Surplus
Town	13020	2961	2893	-68
Villages	13637	3012	3030	18
Master Plan Area	26657	5973	5273	-50

Source: Census 2011

The present deficiency/shortfall of housing is computed as above. Even in year 2011, it can be seen as such there is no shortage of houses in the town area apart from the village area which has only shortage of 18 which can be accredited to that the in villages household size in some of the houses can be bigger.

Newly Arising Need (Demand) Analysis

The newly arising need (demand) analysis is a forward-looking view of the need question. Specifically, it relies on the projected or potential short to medium term household composition of the community to estimate the future need for affordable housing in the community. Together, the current and newly arising need analyses allow the proponent to put forward a project that is better able to accommodate the present and future affordable housing needs of the community.

Table 5-5: Housing need for horizon year – 2041

Housing Demand Gap Analysis										
Master Plan Area	Population		HH's Size	HH's in 2011	HH's Need in 2041	Short fall	Phas e I	Phas e II	Phas e III	Phas e IV
	2011	2041					2021 - 26	2026 - 31	2031 - 36	2036 - 41
Golakganj	26657	39989	4.5	5973	8886	2913	500	900	900	613

Source: Author

According to projected demographics using arithmetic growth rate method 2,913 dwellings are needed to fulfil demand in the master plan area by 2041. Phase wise housing need is calculated that is 500, 900, 900 and 613 for Phase –I, II, III, IV respectively.

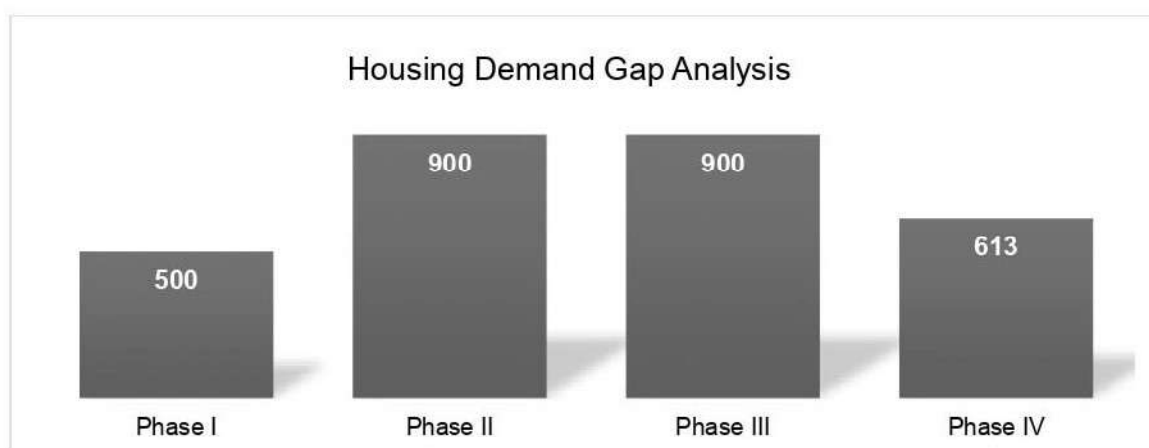


Fig. No. 5-4: Housing need for horizon year – 2041

Source: Census 2011

Supply Analysis

The supply analysis, on the other hand, determines the ability of the community to meet its current and future affordable housing needs in the absence of the proposed project by examining the existing housing stock and anticipated additions.

Assam State Housing board (ASHB) represents a statutory authority constituted by the Government of Assam in 1974 under the Assam State Housing Board Act in 1972, and is mandated with the development of various housing schemes and related infrastructure facilities in the state. The objective of the board is to ensure provision of quality housing accommodation at affordable prices for all sections of the society. Currently housing is being provided through PMAY schemes in both urban and rural areas.

Chapter 6. Transportation

The circulation pattern plays a significant role on the functional efficiency of the Urban Settlement. It is important therefore to evolve an efficient circulation system. This involves movement problems in terms of circulation pattern in road inventory, traffic inventory regional and local passengers and goods movements etc. So that suitable remedies can be evolved both in terms of short term as well as long term measures.

6.1 Transportation Network

Road Network Connectivity

The study area is well connected with important cities like Dhubri in South east, Gauripur in East, Kokrajhar in North East, Cooch Behar in North West and International border with Bangladesh on West. All these cities are well connected through road and rail services.

Road infrastructure is the most important of all public assets, as they encourage economic activity between the large cities the towns and the villages they happen to connect along the way. Such connectivity enables economic activity to spread, allowing under-developed regions to catch up and drive balanced and inclusive growth.

Table 6-1: Detail of Highways and Road Scenario in villages

Roads Scenario	No.of Villages	Percentage Coverage
National Highway	2	18%
State Highway	1	9%
Major District Road	4	36%
Other District Road	11	100%
Black Topped (pucca) Road	5	45%
Gravel (kuchha) Roads	11	100%
Water Bounded Macadam	8	73%
All Weather Road	11	100%
Navigable Waterways (River/Canal)	3	27%

Source: Census 2011

The table and graph give the information about the various typed of road passing through the villages and their percentage. The percentage of NH, SH and MDR type of road passing through the villages is very low which could be attributed to the fact that the master plan area is located on the road diverging from the NH 17.

Only 5 i.e., 45% of the villages have pucca road and 100% of the villages have kuccha road and around 3 villages are having waterway available. From this it can be configured that the pucca roads need to be developed in the master plan area with drain facilities. As per the field observation, roads have been developed in the town area with the major road having bituminous pavement and interior town roads are majorly cement block roads.

Table 6-2: Type and Length of road respectively in Golakganj

Type of Road	Length (in kms.)
Metalled Road	40.7
Paved (Cement Block) Road	18.5
Kuccha Road	39.5

Source: Census 2011

In the village area the roads are under development and the roads developed are majorly cement block road. The road width in the village area is mainly in the range of 3.5m to 5.5m. With the villages included in the master plan the roads need to be widened to improve connectivity and bring development of the area.

Rail Network Connectivity

The master plan area has rail connectivity with important junction of the Dhubri district like Gauripur, Agomani, and Dhubri, in Assam state like Kokrajhar, New Bongaigaon, Guwahati and New Jalpaiguri, Cooch Behar in West Bengal.

As the master plan area has good rail and road connectivity with the other districts and towns this can be utilized because of its strategic location with the international border as it acts as epicenter for export and import of goods.

Airways

The closest airport to Golakganj is Rupsi Airport. The airport is located in Rupsi situated at Kokrajhar district near the border of Dhubri district of Assam. This airport serves as a way for people of the lower part of Assam to travel to India's major cities and states. The newly-launched domestic airlines FlyBig started their operations in the Northeast region on 8 May 2021. Initially, the flight services used to connect Rupsi to both Guwahati and Kolkata Airports only. In due course, other destinations of the Northeast will be covered.

Waterways

At present, there is no waterway route available in the study area. The master plan area act as a straddle across the Gangadhar river.

6.2 Transportation Facilities

The provision of safe, reliable, and affordable rural transport infrastructure and services is essential to facilitate rural access to markets, services, enterprise and employment opportunities, the delivery of health and education, to increase agricultural production, to develop modern supply chains for crop delivery, to prevent food loss, and hence achieving zero hunger and alleviating poverty. Rural transport is indeed an essential rural facilitator for SDG fulfilment. The table below give the details of the transportation facilities available as per census 2011 in the project area.

Table 6-3: Detail of Transportation Facilities Available

Public Transport Scenario	Facilities	No. of Villages	Percentage Coverage
Public Bus Service		5	45%
Private Bus Service		5	45%
Auto/Modified Autos		4	36%
Taxi		5	45%
Vans		7	64%
Tractors		4	36%
Cycle-pulled Rickshaws (manual driven)		11	100%
Cycle-pulled Rickshaws (machine driven)		6	55%
Carts Driven by Animals		10	91%
Sea/River/Ferry Service		2	18%

Source: Census 2011

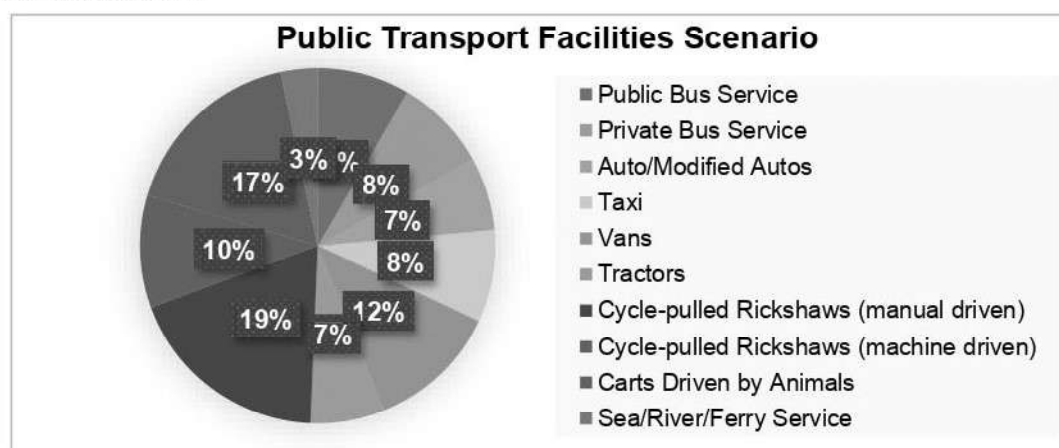


Fig.

No. 6-1: Public Transport Facilities Scenario

Source: Census 2011

The above table clearly depicts that the public transport facility like bus service is very low as it is available in only 5 villages. The reason may be accredited to divergence of the master plan area from NH-17, since most of the public transport buses drop the passengers on the highway only. Taxi or paratransit services are available from the highway to the town. Cycle pulled rickshaws are available in all the villages as it is being used for transfer of good from one place to other. The above data clearly shows the public transport as well as the para transit facilities are not adequate and need improvement and development.

6.3 Traffic Survey

For the traffic volume analysis, field survey was carried out at important junction of the master plan area to know about the present traffic condition prevailing, various modes of transport used and traffic volume on the roads. The three points selected for the traffic survey are:

- 1) Golakganj Town Entry Point,
- 2) Golakganj Market Area Cross-Section,
- 3) Golakganj Thana Chauraha



Fig. No. 6-2: Traffic Survey Locations

Source: Author

To study traffic volume on the selected points traffic count survey was carried out at all the junction from 9:00 am in the morning to 4:00 pm in the evening. The figure below gives the location of each of the point considered.



Fig. No. 6-3: Traffic volume Survey

Source: Author

The traffic volume counted has been segregated into two categories:

- **Fast Moving Vehicles:** In this category following vehicles have been considered which are Two-Wheeler, Car, Van/Pick-up, Small Lorry, Big Lorry, Bus, Tractor and Auto.
- **Slow Moving Vehicles:** In this category following vehicles have been considered which are E-Rickshaw, Rickshaw and Bicycle.

Further total traffic volume has been calculated in PCUs which is compared to the IRC Design service volume for different category of roads to identify whether the road require widening or not. The recommended design service volume as per IRC:

Table 6-4: Type of Carriageway and total design service value respectively for different roads

S.No.	Type of Carriageway	Total Design Service Volume for Different Categories of Urban Roads		
		Arterial	Sub-Arterial	Collector
1	2-Lane (One-Way)	2400	1900	1400
2	2-Lane (Two-Way)	1500	1200	900
3	3-Lane (One-Way)	3600	2900	2200
4	4-Lane Undivided (Two-Way)	3000	2400	1800
5	4-Lane Divided (Two-Way)	3600	2900	-
6	6-Lane Undivided (Two-Way)	4800	3800	-
7	6-Lane Divided (Two-Way)	5400	4300	-
8	8-Lane Divided (Two-Way)	7200	-	-

Source: IRC Standards

Traffic Volume Count for Point 1 Golakganj Town Entry Point

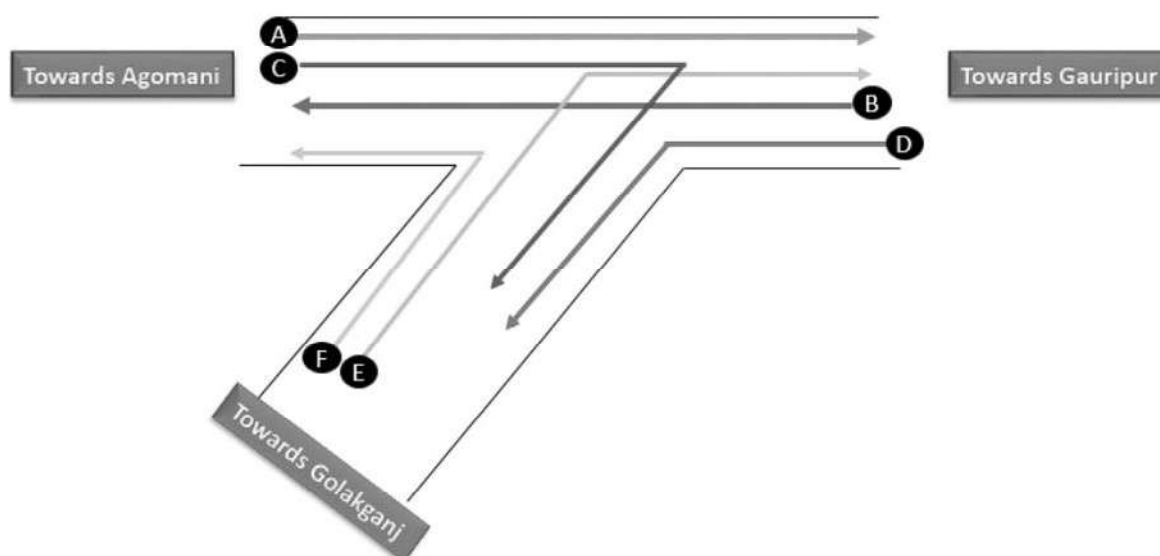


Fig. No. 6-4: TVC for Point 1: Golakganj Entry Point

Source: Author

The entry to the Golakganj town diverges from NH-17. It is a Tri section and traffic survey was conducted at this point from 9:00am in the morning to 4:00 pm in the evening. The field team used to calculate the number of vehicles going from one direction to the other. The figure above gives the direction considered for survey.

The traffic volume for the section is shown in table below. In the table total traffic volume counted for the duration of the traffic survey i.e., from 9 am to 4 pm is represented. Further, the traffic volume during the peak hour is also represented.

Table 6-5: Total Traffic Volume

Direction	Total Traffic Volume from 9am to 4pm			Peak Hour	Peak Hour Volume			% of Fast Moving Vehicle
	Fast Moving Vehicle	Slow Moving Vehicle	Total		Fast Moving Vehicle	Slow Moving Vehicle	Total	
A	795	165	960	11:00 am-12:00pm	186	16	201	92%
B	1039	221	1259		217	31	248	87%
C	97	230	327		25	29	54	46%
D	1036	660	1696		154	118	272	57%
E	945	442	1387		137	64	201	68%
F	197	302	499		4	40	44	9%

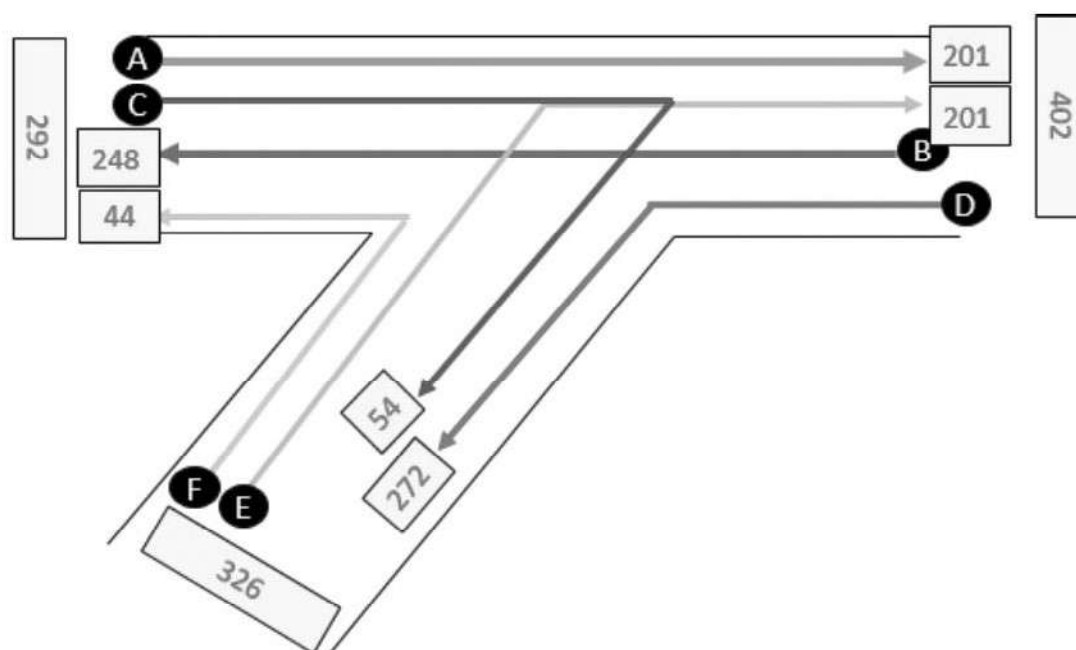


Fig. No. 6-5: Various Direction Considered for Traffic Flow in Tri Section at Golakganj Entry Point
Source: Author

From the above figure and table, it can be seen that approximately 60% of the traffic is diverged from the NH-17 to Golakganj. The percentage of fast-moving vehicle is high in most of the directions. Both the road is 2 Lane two way and as per the standard the recommended design traffic volume is 900 for collector and since the traffic volume is less than the standard therefore there is no need of road widening.

Traffic Volume Count for Point 2 Golakganj Market Area

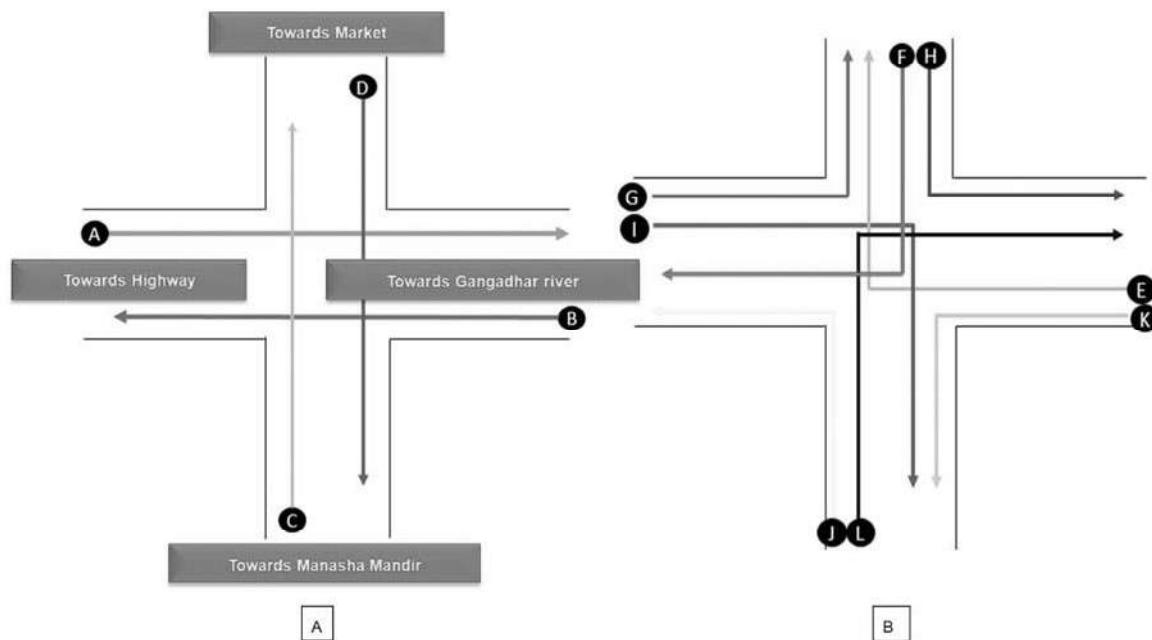


Fig. No. 6-6: Golakganj Market Area Cross Section in which section A shows Through Traffic Direction and Section B shows Turning Traffic Direction

Source: Author

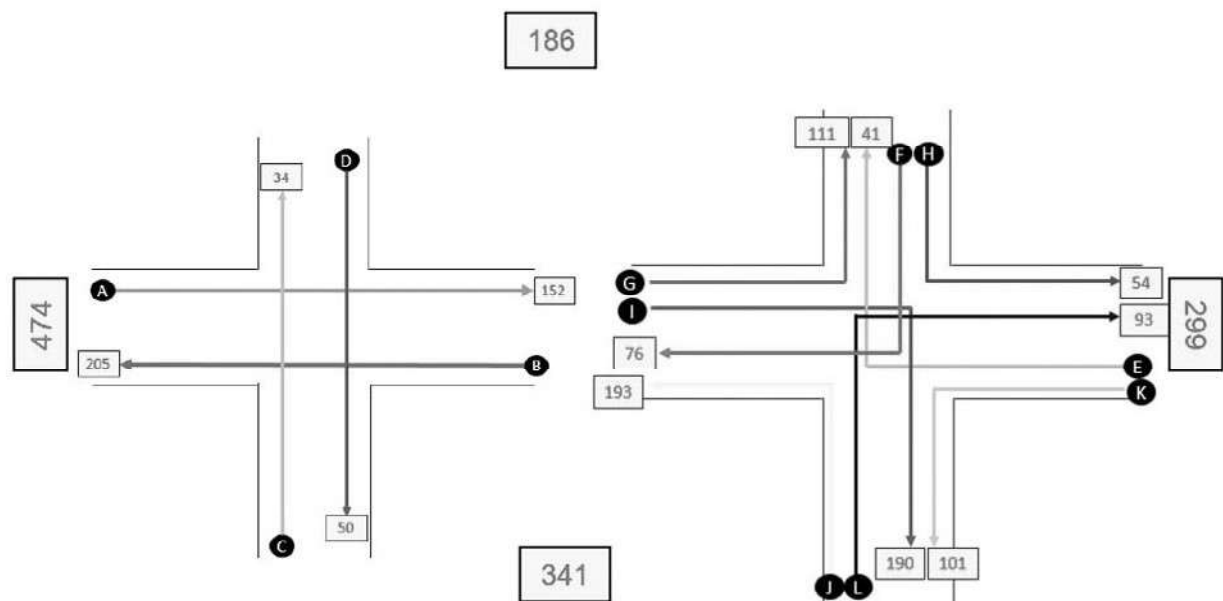
It is one of the major junctions of the Golakganj area. On this junction the market of the Golakganj town is located. The traffic flow is continuous at this road and the major flow is of the e-rickshaw and 2-wheeler on this junction. The direction of the flow of vehicles is mentioned in the figure below.

The above figure shows that the market area cross section which has been divided into two section the first section showing the through traffic direction and the other section showing the turning traffic directions. Traffic flow has been measured for both the sections from 9:00 am to 4:00pm and the traffic volume obtained has been represented in the table below. In the table total traffic volume counted for the duration of the traffic is represented. Further, the traffic volume during the peak hour is also represented.

Table 6-6: Total Traffic Volume

Section	Direction	Total Traffic Volume from 9am to 4pm			Peak Hour	Peak Hour Volume			% of Fast Moving Vehicle
		Fast Moving Vehicle	Slow Moving Vehicle	Total		Fast Moving Vehicle	Slow Moving Vehicle	Total	
A	A	480	613	1094	1:00 pm-2:00pm	76	76	152	50%
	B	561	811	1371		93	112	205	45%

	C	122	169	291	11:00 am- 12:00pm	15	19	34	45%
	D	156	212	369		20	30	50	39%
B	E	95	127	222		18	22	41	45%
	F	191	222	413		32	44	76	42%
	G	188	353	541		40	71	111	36%
	H	137	150	287		27	28	54	49%
	I	461	607	1068		86	104	190	45%
	J	407	607	1014		76	117	193	39%
	K	248	412	660		35	65	101	35%
	L	364	202	566		57	36	93	61%



Source: Author

is higher than the north south direction.

Traffic Volume Count for Point 3 Golakganj Thana Chauraha

road is originated. The direction of the flow of vehicles is mentioned in the figure below.

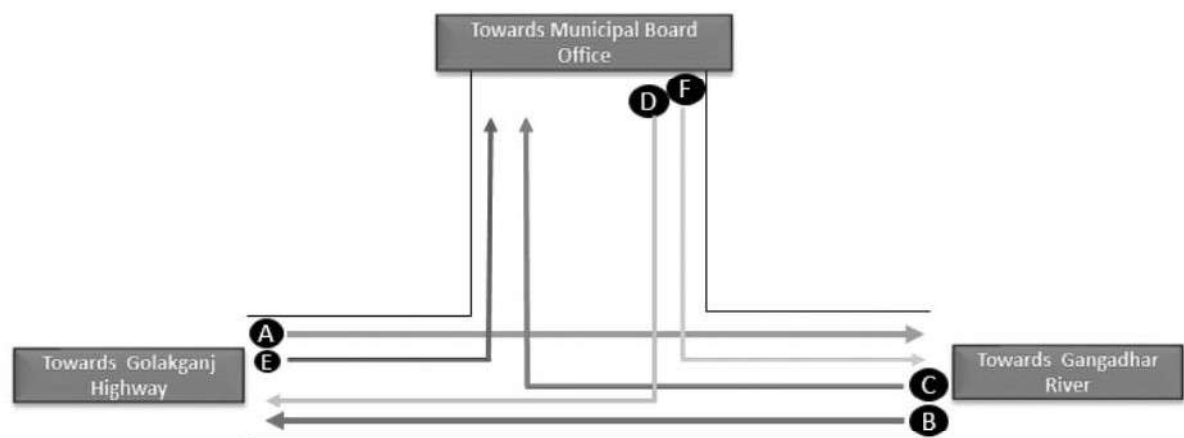


Fig. No. 6-8: Directions considered for Traffic Survey for Golakganj Thana Chauraha
Source: Author

From the figure it can be seen that six direction have been considered for surveying of the traffic volume. The traffic volume for the section is shown in table below. In the table total traffic volume counted for the duration of the traffic survey i.e., from 9 am to 4 pm is represented. Further, the traffic volume during the peak hour is also represented.

Table 6-7: Total Traffic Volume

Direction	Total Traffic Volume from 9am to 4pm			Peak Hour	Peak Hour Volume			% of Fast Moving Vehicle
	Fast Moving Vehicle	Slow Moving Vehicle	Total		Fast Moving Vehicle	Slow Moving Vehicle	Total	
A	737	1066	1804	3:00 pm-4:00pm	123	139	262	47%
B	834	1201	2035		142	129	271	53%
C	347	558	905		58	128	185	31%
D	362	556	918		73	62	135	54%
E	303	694	997		49	76	124	39%
F	349	348	697		102	56	158	65%

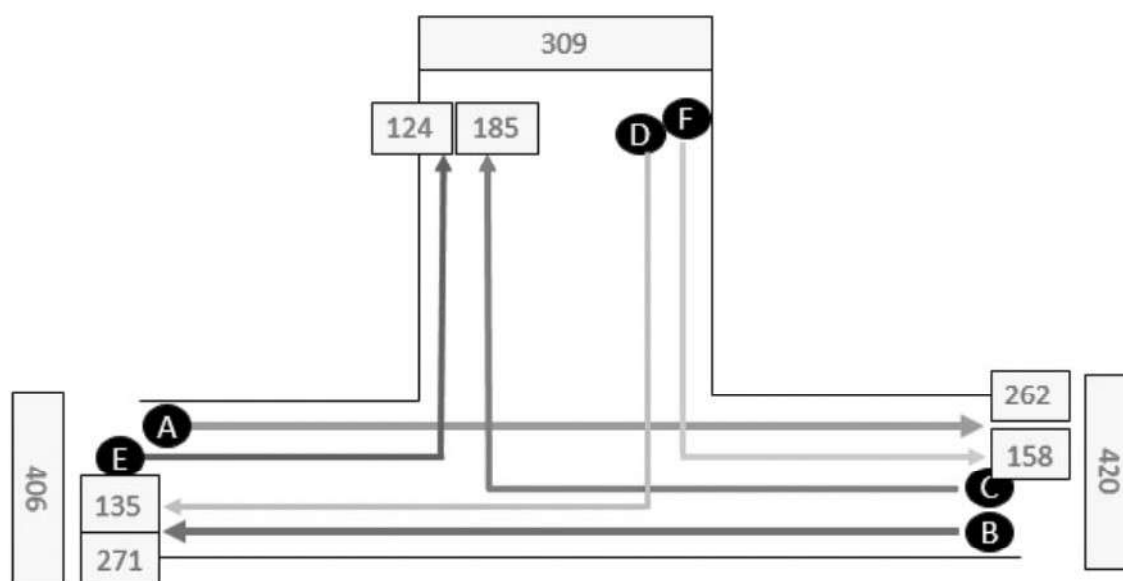


Fig. No. 6-9: Peak Hour Traffic Volume for Golakganj Thana Tiraha

The above table and the figure show the traffic volume for the Golakganj Thana Chauraha cross section and in the figure the traffic volume for the peak hour for each direction is shown. From the figure it could be seen that the traffic flow is very low as per the standard recommended service design volume which is 900 for 2 lane two way so no need of widening.

6.4 Road Hierarchy

The following table shows the existing road condition and width respectively.

Table 6-8: Existing Road Hierarchy

S.No.	Type of Road	Length (KM)	Area (Sqkm)
1	Metaled Road	40.7	0.3
	Up to 3.6 m.	2.0	
	Above 3.6 to 6.6 m.	11.7	
	Above 6.6 to 8.5 m.	13.0	
	Above 8.5 to 12 m.	14.0	
2	Cement Block Road (Paved)	18.5	0.12
	Up to 3.6 m.	11.9	
	Above 3.6 to 6.6 m.	6.6	
3	Kuccha Road	39.5	0.11
	Up to 3.6 m.	37.5	
	Above 3.6 to 6.6 m.	2.0	

Source: Author

Proposal for Transportation

Proposed Width for the existing road in the master plan area is as follows:

Table 6-9 Proposal for Widening of Existing Road

S. No.	Width of existing road	Width of proposed road
1	Up to 3.6 m.	6.6 m.
2	Above 3.6 to 6.6 m.	8.5 m.
3	Above 6.6 to 8.5 m.	10.0 m
4	Above 8.5 to 12 m.	12.0 m
5	Above 12 to 15.0 m.	15.0 m.
6	Above 15.0 m.	Same as existing width

Source: Author

It is also to be noted that the existing kucha road would be made pucca. Further, new roads have been proposed in the area which have been mentioned in the circulation plan. These roads would have width of 4.5m.

Chapter 7. Infrastructure, Public Utilities & Services

7.1 Physical Infrastructure

Physical infrastructure refers to the basic physical structures required for an economy to function and survive, such as transportation networks, communication networks, a power grid, water supply, sewerage, and waste disposal systems. The section below gives the existing situation scenario of physical infrastructure as per the census 2011, for the master plan area.

7.1.1 Water supply

The existing water supply system was built with both using ground and surface water sources. According to census 2011 data, tap connection at the household level is available in only 7 of the 11 villages in the master plan area.

Table 7-1: Detail of Water Supply

Water Supply Scenario	No off Villages	Percentage Coverage
Tap Water-Treated	1	9%
Tap Water Untreated	6	55%
Covered Well	7	64%
Uncovered Well	8	73%
Hand Pump	11	100%
Tube Wells/Borehole	10	91%
Spring	6	55%
River/Canal	2	18%
Tank/Pond/Lake	3	27%

Source: Census 2011

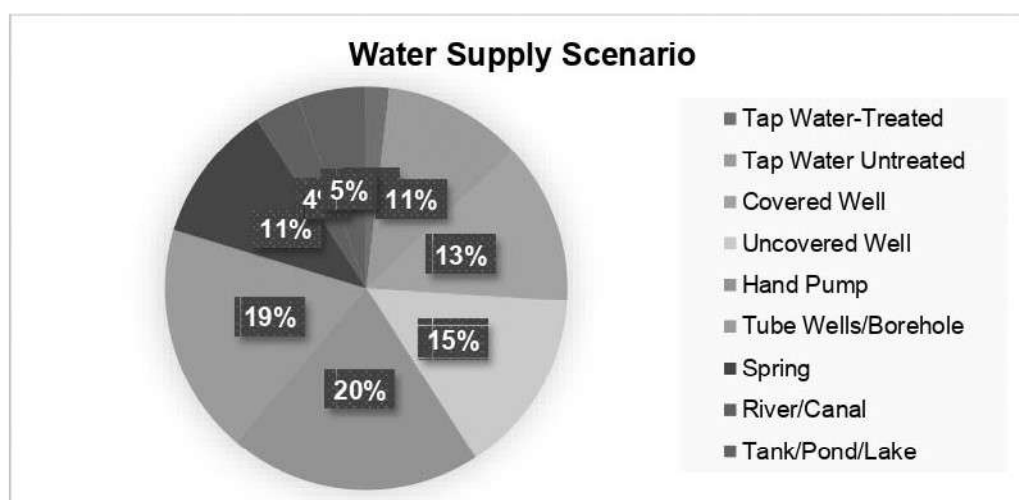


Fig. No. 7-1: Detail of Water Supply

Source: Census 2011

The above table depicts that all the villages have hand pumps and mostly tube well is being used for fulfilling water needs as it was available in 91% of villages. Well and Springs are other sources that are used as water supply sources and are available in around 73% and 55% of the villages respectively. Surface water sources like rivers, canals, and ponds are also available as a water source in around 2 to 3 villages. From the above table it can be inferred that the tap water supply coverage in villages is very low as per the census 2011.

Table 7-2: Water Supply Scenario in Town

Water Supply Sources	System of Storage Source	Capacity Source (in kilo-litres)
Hand pump	Bore Well Pumping System	216
Tube well /Borehole	Bore Well Pumping System	31
Tap water from un-treated source	Service Reservoir	25

Source: Census 2011

The above table gives information related to the water supply source available for water supply in the town area and the system of storage built for each source and the capacity of each source available. As per Census 2011, the town population of Golakganj is 8244, and considering 135 lpcd as the standard water requirement for the town is 1113 kilo litre and the water available from these sources is around 272 kilo litre which shows that these sources are not able to cater to the needs of the population.

As per field observation, most of the villages are being covered with a water supply scheme through Jal Jeevan Mission, and in others, water supply schemes are under construction. In the town area, all the households are having water supply connections and water is supplied for 2 hours in the morning daily through the water supply scheme constructed.

7.1.2 Storm water Drainage

The purpose of providing drains is to carry the rainfall (storm) runoff from the terraces, paved courtyards, footpaths, roads etc. in the area so that flooding does not occur. The table below give the details of the drainage conditions in the project area:

Table 7-3: Detail of Storm Water Drainage for Villages

Drainage Scenario	No of Villages	Percentage Coverage
Closed Drainage	0	0%
Open Drainage	2	18%
No Drainage	9	82%
Open Pucca Drainage Covered with Tiles Slabs	0	0%
Open Kuccha Drainage	3	27%

Source: Census 2011

The percentage of open drainage in the project area is only 18% as per census 2011 it covers only 2 villages and the percentage of kuccha drainage is around 27% which is also very low which shows that the area has poor drainage infrastructure.

As per observation closed drainage is along the Golakganj bus stand road, in the market area and Kalibari road. The drain constructed is mostly closed and is in working condition but the percentage of area covered with drains is very low. The village's do not have a proper drainage system and with the development of water supply system drainage system need to be developed.

7.1.3 Sanitation

The sanitation plays an important role for the health and well-being of the society. Poor hand washing practices and limited access to sanitation facilities perpetuate the transmission of disease-causing germs. The table below give the detail of the sanitation facilities available in the project area: -

Table 7-4: Detail of Sanitation facilities

Sanitation Scenario	No of Villages	Percentage Coverage
Covered under Total Sanitation Campaign (TSC)	1	9%
Community Toilet Complex (including Bath)	0	0%
Community Toilet Complex (excluding Bath)	0	0%
Sanitary hardware outlet availability	0	0%
Community waste disposal system after house-to-house collection	0	0%
Community Bio-gas	0	0%

Source: Census 2011

As per the above table it can be seen that only one village is covered under total sanitation campaign and none of the villages have community toilet facility. There is

no solid waste management system practiced in the villages. There are no community bio gas plant running or developed in the area. The sanitation facilities coverage in Golakganj town as per census, 2011 is mentioned in the table below. From the table it can be seen that around 30% of the household have latrines pit and 34% of the households have Pour Flush latrines which shows that open defecation is practiced in the area and proper sanitation facilities are not present in the area.

Table 7-5: Sanitation facilities in Golakganj Town

Sanitation Scenario		
Latrines-Pit	550	46%
Latrines-Flush/Pour Flush	637	54%

Source: Census, 2011

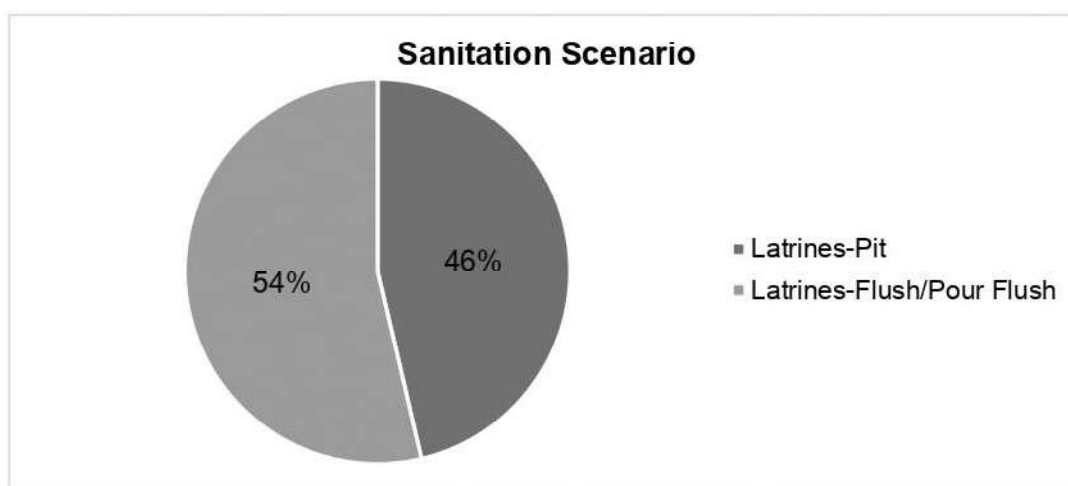


Fig. No. 7-2: Sanitation facilities in Golakganj Town

Source: Census 2011

7.1.4 Solid Waste Management

Currently no solid waste management practices is being followed in the villages and the garbage is thrown in the low lying ground which act as a breeding ground for germs and causes diseases. In the town also no solid waste management is practiced. Municipal board for the town has been recently established and is working on development of services in the town.

7.1.5 Power Supply

The power supply improves individual quality of life, facilitates community services such as health and education and enables business entities to carry out professional activities for rural populations. In rural areas the demand for electricity is defined by household energy demands, needs for irrigation and local agro processing or other natural resource. The table below give the detail of the power supply in the project

area as per Census, 2011. As per the table below 100% of the villages were electrified before 2011 and around 36% of the villages utilised power facility available for irrigation purpose and 18 % of the villages utilised power supply for commercial use.

Table 7-6: Detail of Power Supply

Power Supply Scenario	No of Villages	Percentage Coverage
Power Supply for Domestic Use	11	100%
Power Supply for Agriculture Use	4	36%
Power Supply for Commercial Use	2	18%

Source: Census 2011

The table below summarises the power supply conditions in Golakganj town as of the 2011 census. According to the table, approximately 58% of the households in the town have domestic electricity connections, there is no power supply for irrigation, commercial and road lighting purposes in the town demonstrating the area's backwardness and poor infrastructure.

Table 7-7: Power supply conditions prevailing in Golakganj Town

Power Supply Facilities in Golakganj Town		
Electricity-Domestic Connection	1077	58%
Electricity-Industrial Connection	0	0%
Electricity-Commercial Connection	0	0%
Electricity-Road Lighting Connection	0	0%
Electricity-Others Connection	0	0%

Source: Census 2011

7.2 Social Infrastructure

Social infrastructure plays an important role in both the economic development of a nation and the development of society's quality of life. Social infrastructure enhances social wellbeing and furthers economic growth by providing basic services and facilities which allow businesses to develop and flourish. Education, health, public and recreational facilities are the core elements of social change which serve as a base for the process of social development of an economy. They provide indirect support by building the social sector of the economy. Social infrastructure refers to the main elements of social change which serve as a base for the process of social development of a country. The section below gives the existing situation scenario of social infrastructure as per census 2011, for the project area.

7.2.1 Education Facilities

Education is important for everybody, whether they are learning new facts, skills, or trades. Having the opportunity to learn always benefits the individual. An education system in rural communities has the opportunity to build capacity and knowledge in the rural populace, helping them to make informed decisions about their farms and to innovate in agricultural affairs. Education also exposes the masses to information and helps prevent the misinterpretation of information. Education can lead to many positive outcomes, such as an improved ability to understand policies, procedures, rights, duties, government schemes, legislation, available benefits, and protection laws. The table below gives detail of education facilities available in the project area as per Census 2011.

Table 7-8: Details of Education Facilities

Education Facilities	Facilities in Villages	Facilities in Town
Pre-Primary School	7	
Primary School	23	6
Middle School	11	4
Secondary School	2	5
Senior Secondary School	1	1
High Degree College (Engineering, Medical, Management, ITI, Polytechnic)	0	1

Source: Census, 2011

From the table it can be inferred that there are no higher educational facilities available in the village area only one higher degree college available in the town which is Chilarai College. Most of the schools are government. There is need of skill development centre, and higher educational facilities in the area so as to reduce the dependence on Dhubri city. From the above table it is clear that there is only one senior secondary school in the village and town which is very low in comparison to the population of the area.

7.2.2 Healthcare Facilities

Healthcare is the right of every individual but lack of quality infrastructure, dearth of qualified medical functionaries, and non-access to basic medicines and medical facilities is a great issue in the rural area. Rural health care services in India are mainly based upon primary health care, which envisages healthy status and well-being for all.

The table below give the detail of the healthcare facilities available in the area as per Census, 2011.

Table 7-9 Details of Healthcare Facilities for Group-3

Health Care Facilities	Number
Primary Health Sub Centre	3
Maternity And Child Welfare Centre	2
Veterinary Hospital	1
Medicine Shop	9

Source: Census, 2011

The above table shows that there is no community health centre facility available and there are only 3 Primary Health Sub Centre (PHSCs) available in the 11 villages which is around in 27% of the villages. There are 2 maternity and child welfare centre, 1 veterinary hospital and 9 medical shop available in the village area. The above health facilities available are not sufficient and require improvement. The table below give the details of health care facilities available in the Golakganj Town area.

Table 7-10: Health care facilities available in Golakganj Town

Health Care Facilities	Number	Health Care Facilities	Number
Hospital Allopathic	1	T.B. Hospital/ Clinic	1
Dispensary/Health Centre	1	Nursing Home	0
Family Welfare Centre	1	Veterinary Hospital	1
Maternity and Child Welfare Centre	1	Mobile Health Clinic	0
Maternity Home	1	Medicine Shop	12

Source: Census 2011

From the table it can be seen that the town has various category of the health care facilities.

7.2.3 Public Services Facilities

Public Facilities refers to the various services that are given by the government for the well-being of the citizens of the country. The primary goal of the government is to provide adequate facilities to the public as well as the business groups for ensuring that there is a smooth flow of all the activities that are being carried out. The table below give the list of the public facilities available in the project area as per Census, 2011.

Table 7-11: Details of Public Services in villages

Public Services Facilities Analysis	Facility Available	Percentage Coverage
Post Office	0	0%
Sub Post Office	3	27%
Telephone (landlines)	4	36%
Mobile Phone Coverage	6	55%
Internet Cafes / Common Service Centre (CSC)	1	9%
Private Courier Facility	0	0%
ATM	0	0%
Commercial Bank	0	0%
Cooperative Bank	0	0%

Source: Census 2011

From the table it can be seen most of the facilities are not available except communication services and sub post office. The low percentage shows that the area is underdeveloped and with the incoming of the villages in the master plan area it would require improvement over the existing infrastructure.

The table below give details of the public service facilities available in Golakganj town area. From the table it can be seen that there are 2 nationalised bank and 1 private commercial bank are available in the area. The area does not have any agricultural credit society even though agriculture is predominant in the area.

Table 7-12: Details of Public Service Facilities

Public Services Facilities Analysis	Number
Nationalized Bank	2
Private Commercial Bank	1
Co-operative Bank	0
Agricultural Credit Society	0
Non-Agricultural Credit Society	0

Source: Census 2011

7.2.4 Socio Cultural Facilities

These facilities are required to support the daily life of the people living in the area. The table below give the details of the socio-cultural facilities available in the area as per Census, 2011.

Table 7-13: Details of Socio-cultural Facilities

Socio Cultural Facilities Analysis	Facility Available	Percentage Coverage
Agricultural Credit Societies	0	0%
Self - Help Group (SHG)	9	82%
Public Distribution System (PDS) Shop	7	64%
Mandis/Regular Market	3	27%
Weekly Haat	7	64%
Agricultural Marketing Society	0	0%
Nutritional Centres-ICDS	5	45%
Nutritional Centres-Anganwadi Centre	10	91%
ASHA	10	91%

Source: Census, 2011

From the table it can be inferred that there are no agricultural credit and marketing society in the area is very low even though farming is the main occupation practiced. The Anganwadi and the ASHA has been present mostly in all the villages. Self Help Group and PDS shops are also available in most of the villages which shows that the government policy coverage is available in the area.

7.2.5 Recreational Activities

Recreational facility is an important part of human life. It attracts people as it offers greater pleasure in life. It develops a strong healthy environment for a better life style of public. Various facilities in recreational area are the source of human comforts. The table below give the details of recreational activities facilities available in the project area as per census 2011.

Table 7-14: Details of Recreational Activities

Recreational Activities Analysis	Facility Available	Percentage Coverage
Community Centre with/without TV	0	0%
Sports Field	8	73%
Sports Club/Recreation Centre	2	18%
Cinema/Video Hall	0	0%
Public Library	0	0%
Public Reading Room	0	0%
Assembly Polling Station	10	91%

Source: Census 2011

From the table it can be inferred that the sports field and polling stations are available in most of the villages but rest of the facilities are very low in the area which shows that the recreational facilities are not developed. The table below give the details of the recreational facilities in the town area.

Table 7-15: Details of Recreational Facilities

Recreational Activities	Number
Stadium	0
Cinema Theatre	0
Auditorium/Community Hall	2
Public Library	0
Public Reading Room	0

Source: Census 2011

From the table it can be inferred that there is no recreational facility available, only 2 community halls are present. As per field observation stadium facility is available and various community hall are already available further marriage hall is under construction.

7.3 Proposed Physical Infrastructure

Physical Infrastructure is the term used for the basic services and facilities which are integral part of urban development. It is the backbone of any settlement. The quality of infrastructure is a good indicator of quality of life of people. It also has a strong relation with the growth and development of the region. Some of the major aspects that are covered under this are water supply system, drainage and sewerage network.

7.3.1 Water Supply Infrastructure

Water demand estimation

Water demand for any area depends on the land use pattern of the area and type of living standards of the population residing in the area. Future water demand for the project area is estimated based on the projected population of the area. The population of the master plan area is 26657 as per census 2011. The projected population of the area for the year 2041 has been estimated at 39989. And projected water demand for year 2041 is 8.7 MLD. The water demand calculation is discussed in below table:

Table 7-16: Water Demand Calculation as per CPHEEO & URDPFI

Water Demand Calculation, as per CPHEEO and URDPFI						
Water Supply Per Activity		2021	2026	2031	2036	2041
		Litres per Day				
Rural	Population* (70)	1132915	1222078	1311240	1400403	1489565
Urban	Population* (135)	2013728	2141741	2269755	2397769	2525783
Total Water Demand (excluding industrial activities)		3146642.5	3363818.75	3580995	3798171.25	4015347.5
Water Demand Calculation for Public and Semi - public (5% to total water demand)		157332.125	168190.9375	179049.75	189908.5625	200767.375
Water Demand Calculation for Industries-						
Proposed Industrial Area	Ha	5	10	20	40	60
Water Demand Calculation	Assumed 1 ha = 45CuM	225	450	900	1800	2700
	1 CuM = 1000 liter	225000	450000	900000	1800000	2700000
	20% for Ancillary Industries	45000	90000	180000	360000	540000
Total Water Demand for Industrial Area	Adding industries and ancillary industry	270000	540000	1080000	2160000	3240000
Subtotal - 1		3573975	4072010	4840045	6148080	7456115
Fire Fighting (1% of Total Demand)		35739.74625	40720.09688	48400.4475	61480.79813	74561.14875
Subtotal - 2		3609714	4112730	4888445	6209561	7530676
Water Losses (Assumed 15% water demand)		541457.1557	616909.4677	733266.7796	931434.0916	1129601.404

Total Water Demand	LPCD	4151172	4729639	5621712	7140995	8660277
	MLD	4.2	4.7	5.6	7.1	8.7

Source: URDPFI Guidelines, CPHEEO

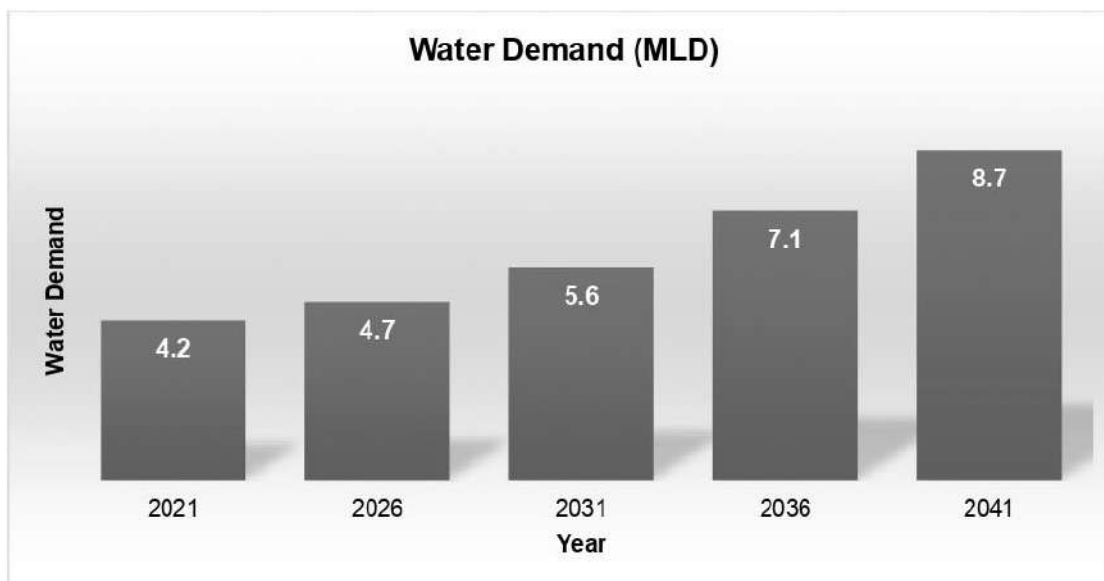


Fig. No. 7-3: Water Demand Calculation as per CPHEEO & Master Plan

Source: CPHEEO, URDPFI Guidelines

The amount of water needed to meet community demand by 2041 is 8.7 MLD, as determined by the standard obtained from CPHEEO and URDPFI guidelines. This water demand can be met by using ground water and surface water sources available in the master plan area. The land requirement for setting up of the water supply system as per URDFI guideline will be around 0.19 hectares.

Table 7-17: Land requirement for WTP

Land requirement for Water Supply System		
S. No.	Identified Capacities	Land Requirement (Hectares)
1	5 MLD	0.10
2	10 MLD	0.19
3	50 MLD	0.93
4	100 MLD	1.87
5	200 MLD	3.73
6	500 MLD	9.34

Source: URDPFI Guidelines

A typical water supply scheme would be based on utilising the surface water, ground water, and rainwater sources for delivering water for domestic and other purposes. The water distribution system would be developed focusing on effectively traversing water with little to no non-revenue water (NRW).

Climate Resilient Water Management (Possible intervention)

Currently, there is need to develop infrastructure which is climate resilience, hence resilient water management is required as master plan area experiences annual rainfall of more than 1500 mm, therefore the region is vulnerable to flooding and the area is also prone to earthquake as it lies in the seismic zone v. Hence possible intervention and innovative technique are been discussed as to provide climate resilient infrastructure in delineated area.

Table 7-18: Climate resilient water management activity

Hazard	Impact on water supply system		Adaption
	Direct	Indirect	
Drought	Reduced water availability	Migration of HH residing in area	Collection & Storage of surface runoff water: <ol style="list-style-type: none"> 1. Below ground tanks excavation can be done into which rainwater is directed toward ground surface 2. Small reservoir with earthen bunds or embankment to contain runoff or river flows 3. Aquifer recharge: capturing and recharging excess runoff in the vicinity of well or borehole 4. Rainwater collection and storage on individual households to collect potable water. New or rehabilitated groundwater sources: <ol style="list-style-type: none"> 1. To establish relief borehole with restricted use in emergency

Flooding	Damage to infrastructure		<p>Improve resilience for protected well heads / inclusive of borewell.</p> <ol style="list-style-type: none"> 1. Raising the well heads 2. Est. Casing wells 3. Switching from unprotected to protected wells 4. Raising the wellheads 5. Establish drainage ditches, levees, artificial waterway for flood protection <p>Community managed water supply system</p> <ol style="list-style-type: none"> 1. To make training programme for water system operator <p>Household water treatment and safe storage</p>
Catchment Degradation			<p>Natural resource management / soil, water conservation activities:</p> <ol style="list-style-type: none"> 1. Gully rehabilitation 2. Water harvesting 3. Runoff management (Mulch farming, contour farming, etc.)

7.3.2 Sewerage and Sanitation

The primary goal is to provide basic sanitation facilities like community toilet complexes, sanitary hardware stores, community waste disposal systems, community bio-gas facilities, and village areas covered by sanitation campaigns in all villages of master plan area because the sanitation facilities in the zone are in poor condition and most villages lack them.

Sewerage / Sanitation scheme: Sewage System refers to a system of sewers and accessories for the collection and transportation of sewage generated from each property to sewage pumping station for pumping to sewage treatment and disposal. There are two different kinds of sewer systems.

1. Independent sewage system
2. Combined sewage system

For the master plan area, the sewerage system which can be adopted is separate sewage system will be made up of two major trunk lines, one for storm water and the other for the sewer system. The sewer system line will transport waste water to the treatment facility, which will treat the sewer and discharge the entire water into the river bed.

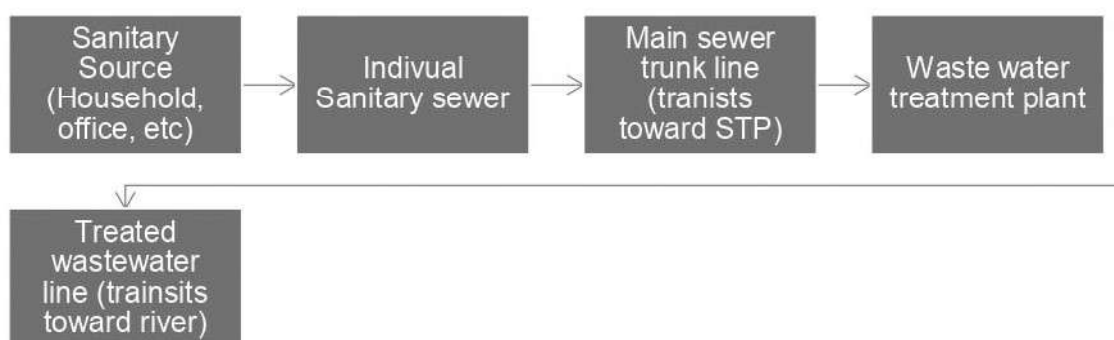


Fig. No. 7-4: Recommended sewer system Procedure
Source: Author

The total water requirement for the Planning Area for is 8.7 MLD for 2041. The sewerage flows have been calculated assuming that the total sewerage flow is generally 80% of the total water demand. The total sewage generated in the master plan area in the year 2041 is 7 MLD.

Table 7-19: Estimated sewage generation in project area

S.No.	Year	Water demand (MLD)	Estimated Sewerage Generated (MLD)
1	2021	4.2	3
2	2026	4.7	4
3	2031	5.6	4
4	2036	7.1	6
5	2041	8.7	7

Source: Author

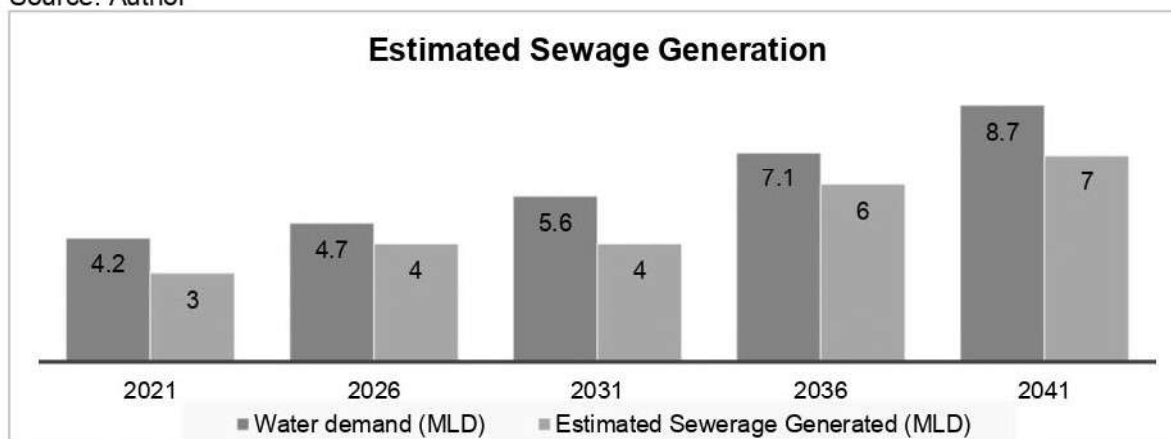


Fig. No. 7-5: Estimated Sewage Generation in project area

Source: Author

While planning for the proposed sewerage system, consideration is given to the natural drainage pattern. The sewerage system is planned in such a way that there will be minimum pumping involved in collection and conveyance of sewage.

For treatment purposes, apart from conventional methods, STPs can be based on SAFF (Submerged Aerated Fixed Film) technology, Activated Sludge Process (ASP), Extended Aeration with ASP, UASB process (Up-flow Anaerobic Sludge Blanket) etc.

Land Area Requirement for Different STPs

Table 7-20: Land Area Requirement for Different STPs

Sl. No.	STP Process	Land Area Required (Hectare)	Applicability
1	Waste Stabilisation Pond System (WSPS)	0.80 to 1.5	Suitable under warm Indian climatic conditions, For areas with easy availability of land, In areas with social preference for aquaculture, In areas with low, unreliable or expensive power supply.
2	Facultative Aerated Lagoon (FAL)	0.27 to 0.4	Stand-alone system for sewage treatment, As an up-gradation option for overload WSPs
3	Activated Sludge Process (ASP)	0.15 to 0.25	The most widely used option for treatment of domestic wastewater for medium to large towns where land is scarce
4	Fluidized Aerated Bed (FAB)	0.06	The FAB technology-based system is particularly applicable for: small to medium, flows in congested locations, approach Reliving existing overloaded STPs

Source: URDPFI Guidelines

7.3.3 Storm water Drainage

The storm water drainage system for the master plan is made to collect storm water from both public and private properties around the area. To move stormwater to neighbouring streams, the area will maintain a system of culverts, storm sewer pipes,

and drains. The device aids in safeguarding water quality and reduces the chance of floods, which can harm the environment and cause property damage.

The stormwater drainage system for the zone is made to collect stormwater from both public and private properties around the area. To move stormwater to neighbouring streams, the area will maintain a system of culverts, storm sewer pipes, and drains. The device aids in safeguarding

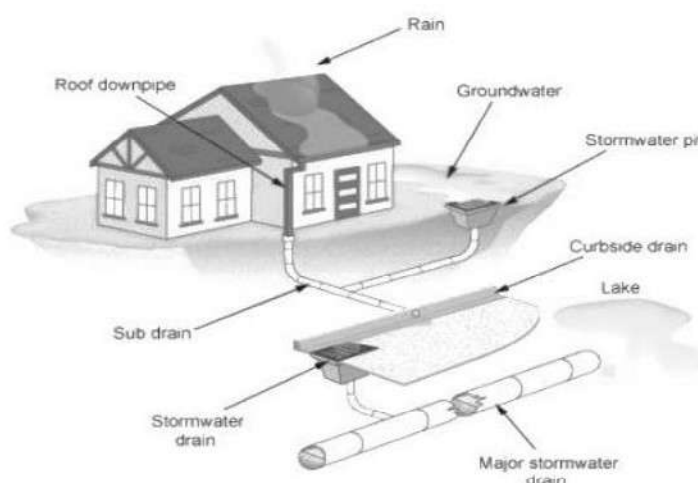


Fig. No. 7-6: Storm water drainage system

water quality and reduces the chance of floods, which can harm the environment and cause property damage. The sources in the zonal region will have access to a sewer system that includes a stormwater pit and a stormwater drain. The excess water will then go to a large stormwater drain, which will then move it to natural resources like rivers and canals in order to avert flooding situations.

7.3.4 Solid waste management

The waste generated per day is estimated on the basis of URDPFI guidelines and CPHEEO manual. To estimate the amount of waste generated various sources of waste generation have been considered. The amount of waste generated per day has been calculated in the table below.

Table 7-21: Estimated Solid Waste generation by Land use type

Land use type	Estimated waste generation	2021	2026	2031	2036	2041
Residential refuse	0.3 to 0.6 kg/cap/day	9330	9997	10664	11330	11997
Commercial refuse	0.1 to 0.2 kg/cap/day	3110	3332	3555	3777	3999
Street sweepings	0.05 to 0.2 kg/cap/day	3110	3332	3555	3777	3999
Institutional refuse	0.05 to 0.2 kg/cap/day	3110	3332	3555	3777	3999
Total Waste Generated	Kg	18661	19994	21327	22660	23993
	Tonne	19	20	21	23	24

Source: Author

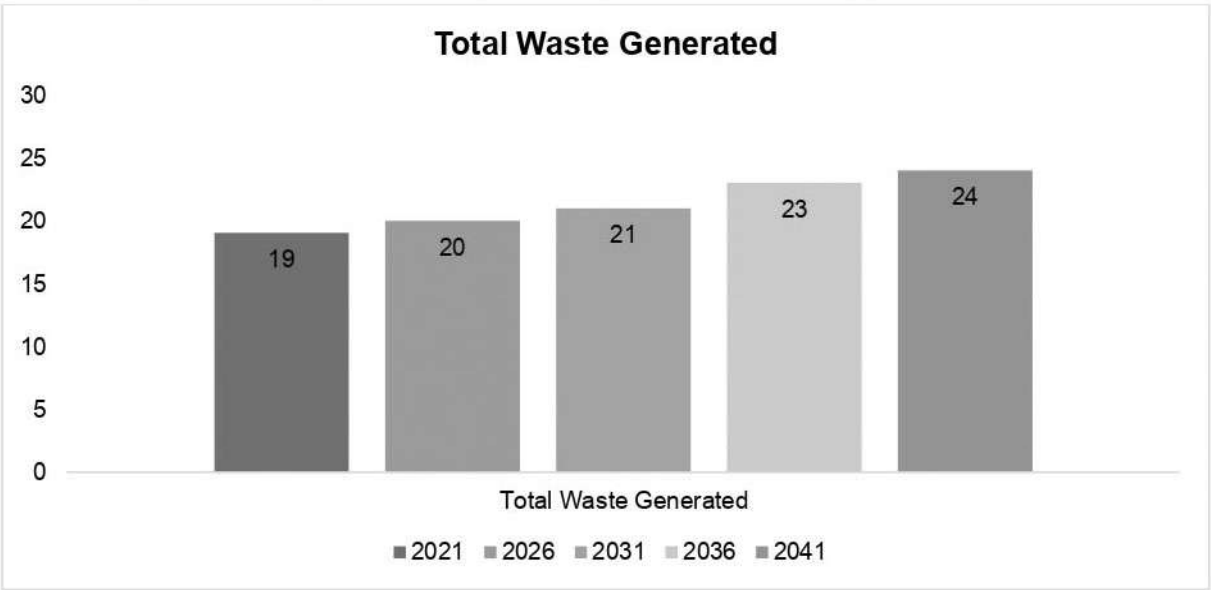


Fig. No. 7-7: Estimated Solid Waste generation
Source: Author

From the above table it can be inferred that the waste generated in the master plan area is around 24TPD out of which mostly is the residential refuse. With the development of the area waste generation is also increasing and would be requiring an improved solid waste management method which would be useful in maintaining the area green and clean.

Management of Solid Waste

With the development of the master plan area in the future and the waste generated there will be a need to manage the waste generated both in urban and rural area. Below is the solid waste management strategy that can be practices for proper management, treatment and disposal of the solid waste generated.

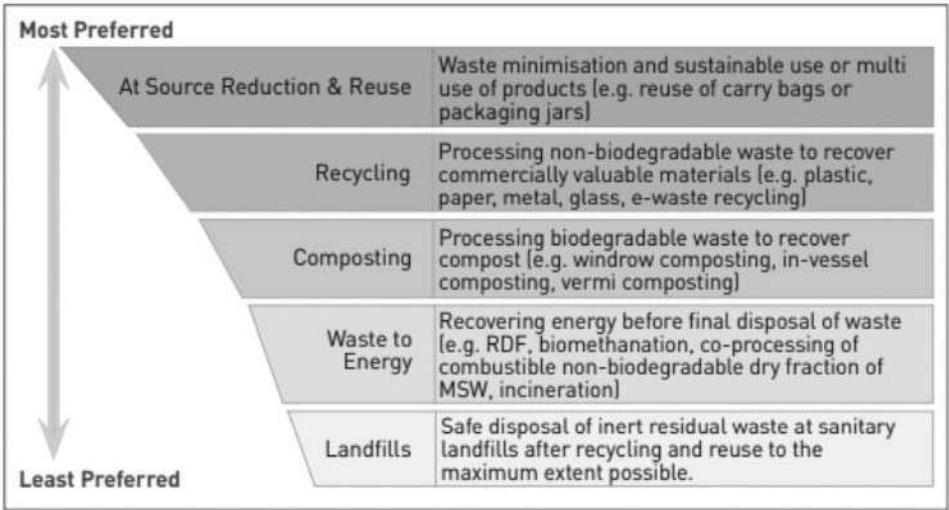


Fig. No. 7-8: Guiding Principle of Solid Waste Management

Management at Household Level

At the household level, the solid waste needs to be segregated so that the treatment can be done effectively. This will simplify the process as there will be no need to segregate the waste at later stages. This will also effectively reduce the time taken in the whole process. For this purpose, the waste at household level can be categorized as;

a) Biodegradable wastes

b) Non-biodegradable wastes

- Recyclable
- Non-recyclable

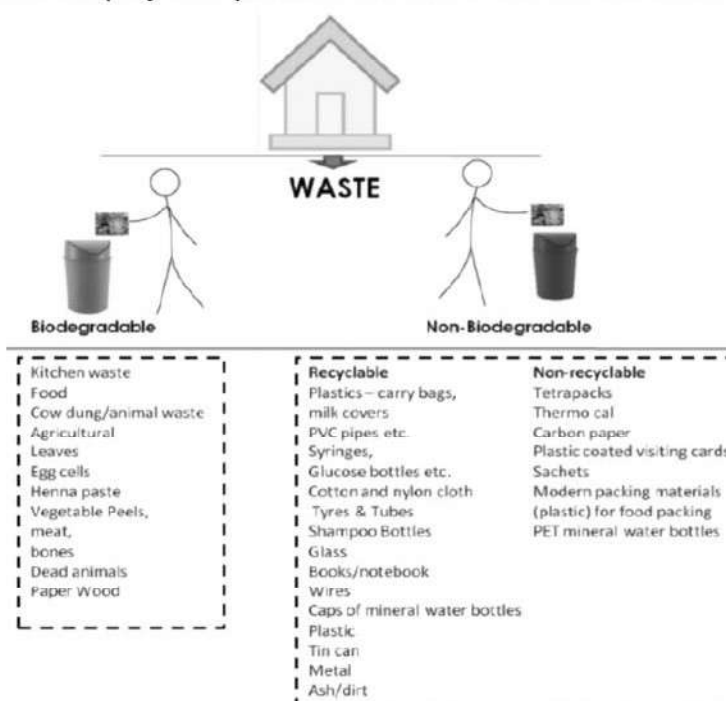


Fig. No. 7-9: Waste Segregation

Biodegradable wastes will be put separately in separate-colored bins of 5-to-10-liter capacity. Green dustbins will be provided for biodegradable wastes and red bins will be provided for non-biodegradable recyclable and non-recyclable wastes.

Treatment of Biodegradable Waste at Household Level

In the villages biodegradable waste generated can be treated at household level by converting it into useful products like manure using household level composting. For this, various methods like pit, pot, tripot, ring, kitchen bin and pipe composting can be adopted. The size of the pit will depend upon the quantity of refuse to be disposed of per day. Each day the garbage, cattle dung, straw, plant and agriculture wastes are dumped into the manure pit. When one pit is closed the other pit can be used. In 4 to 6 months' time, the refuse is converted into manure, which can be used in the fields.

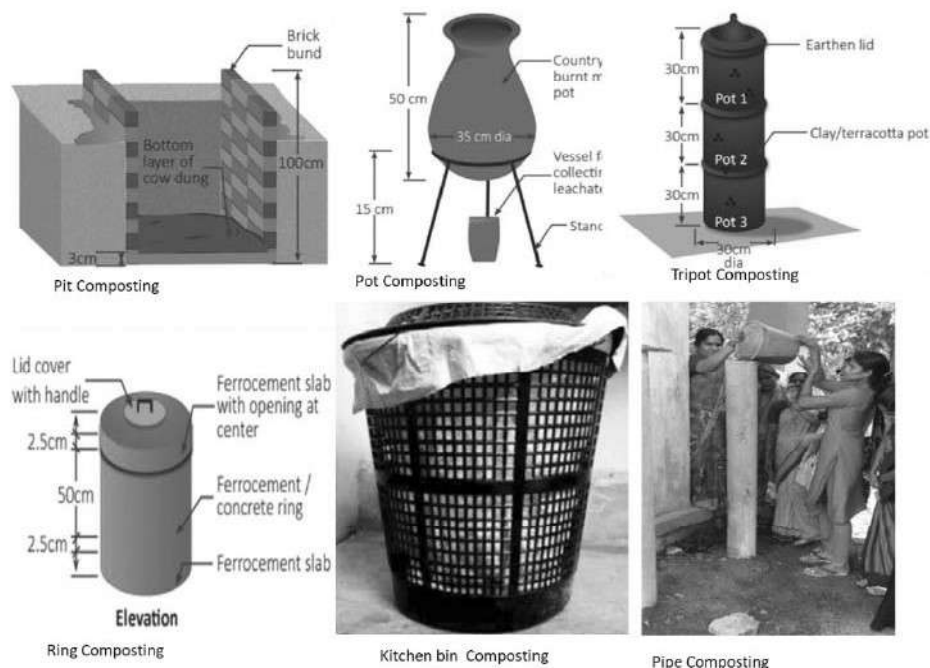


Fig. No. 7-10: Various methods for household level composting to be adopted in Project area

Management at Community Level

The waste generated at each household will be collected by sanitation workers and this will be later transported to the composting site or the landfill site based on the nature of the waste. All the biodegradable wastes will be composted at the community level. The wastes which cannot be composted and are non-recyclable will be taken to the landfill sites for disposing with appropriate procedure. The people will be encouraged to keep recyclable non-biodegradable wastes separately and sell to the rag pickers and kabadiwalas.

Table 7-22: Management of Solid Waste at Community level

S.No.	Population range	Waste Gen.TPD	Composition	Technological options
1	Less than 50,000	Less than 10	Biodegradables 45 to 65 %	BM, VC / CC and RDF
2	50,000 to 1 Lakh	10 to 30 TPD	Biodegradables 45 to 60 %	BM, VC or CC RDF
3	1 Lakh to 10 Lakh	30 to 550 TPD	Biodegradables 40 to 55 %	IWP-BM, CC + RDF as feed stock to power plant / cement industry. Plastic to fuel oil
4	1 M to 2 million	550 to 1100 TPD	Biodegradables 40 to 55 %	IWP comprising -BM +CC+ RDF. W to E plant for power,

				where wastes exceeds 500 TPD based on: gasification, pyrolysis, incineration and mass burning. RDF to cement industry Plastic to fuel oil
5	Above 2 million	>1100 TPD	Biodegradables 35 to 50 %	IWP comprising -BM +CC+ RDF. W to E plant for power, based on: gasification, pyrolysis, incineration and mass burning. RDF to cement industry Plastic to fuel oil

*IWP- Integrated Waste Plant, BM- Biomethanation, VC- Vermicomposting, CC- Chemical Conversion, RDF Refused Drive Fuel

Source: Solid Waste Management Rules, 2016

Management of Recyclable Waste

The non-compostable solid waste can be temporarily stored by the local body or any other entity authorised which will facilitate segregation, sorting and recovery of recyclables from various components of waste by authorised informal sector of waste pickers, informal recyclers or any other work force engaged for the purpose before the waste is delivered or taken up for its processing or disposal. Material recovery starts at the primary level, by households who segregate recyclables like newspapers, cardboard, plastics, bottles, etc. from waste to sell such material to local recyclers, scrap dealers or haulers. The dry fraction of the segregated waste may be further segregated locally, at the transfer station or at the processing plan. Special waste including domestic hazardous waste that is collected either along with the dry waste fraction or separately is also to be segregated at the material recovery facility (MRF) and disposed according to the nature of the waste. Recyclable waste should be sent to the recycling industry, and hazardous waste (bio medical waste) should be disposed at the nearest treatment, storage, and disposal facility (TSDF). Sorted materials after segregation are usually too large for further use or processing; they should be reduced to smaller sizes which will be bailed for further processing.

Construction and Demolition Waste (C&D)

C&D and other inert waste may be utilised for making bricks, pavement blocks, construction materials such as aggregates etc. Ward level debris deposit sites should be created. Containers could be provided at such locations, and a small collection charge could be levied for receiving such waste and transporting it for disposal. There are several plants of various capacities in India to make bricks, paver blocks, aggregates, etc. out of such waste material.

Disposal of Solid Waste

Once the biodegradable and recyclable waste is segregated the remaining waste would be disposed to the landfill site. The land requirement for the landfill site has been calculated as per CPHEEO Manual as per the standard land required for sanitary landfill for 300 TPD of MSW around 30 ha of land is required for 20 years. A total area of 2.4 ha is required as per projected calculations for the landfill site in 2041.

Table 7-23: Land requirement for Landfill site

Land Requirement for Landfill Site			2021	2026	2031	2036	2041
Master Area	Plan	Waste Generated	19	20	21	23	24
		Landfill Area Requirement (ha)	1.9	2.0	2.1	2.3	2.4

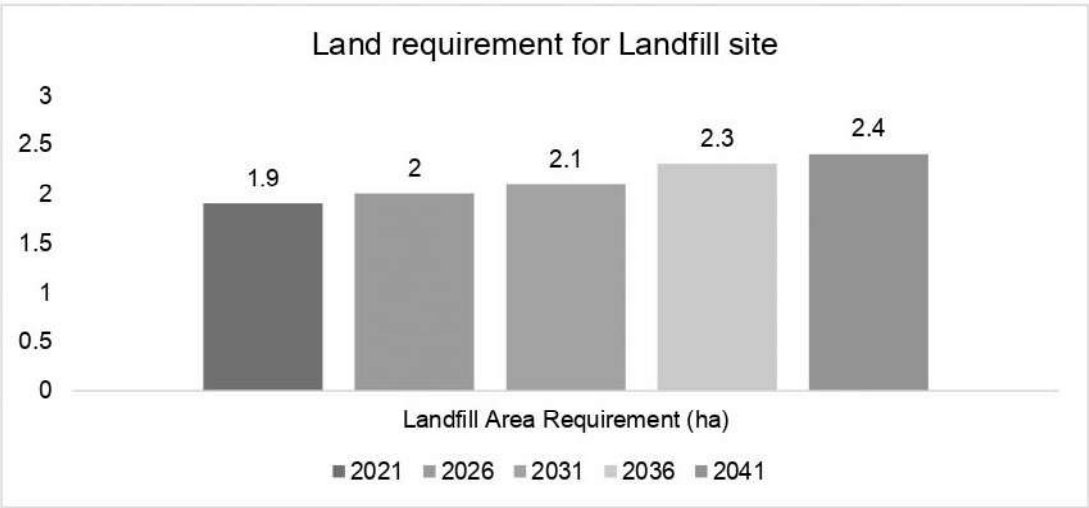


Fig. No. 7-11: Land Requirement for Landfill Site
Source: Author

7.3.5 Power supply

In this section power demand for the master plan area has been calculated for the year 2041 as per the standard usage which is 1000 units per capita per year, or 2.74 kWh per capita per day, as stated in the National Electricity Policy, which was published in

2005. This figure takes into account domestic, commercial, industrial, and other needs. Considering the same the Power required in KWh is calculated for the projected population for the year 2041.

Table 7-24: Power required in KWh per day

S.No.	Year	Estimate Population	Power Required in KWh per day
1	2021	31101	85217
2	2026	33323	91305
3	2031	35545	97393
4	2036	37767	103482
5	2041	39989	109570

Source: National Electrical Policy, 2005

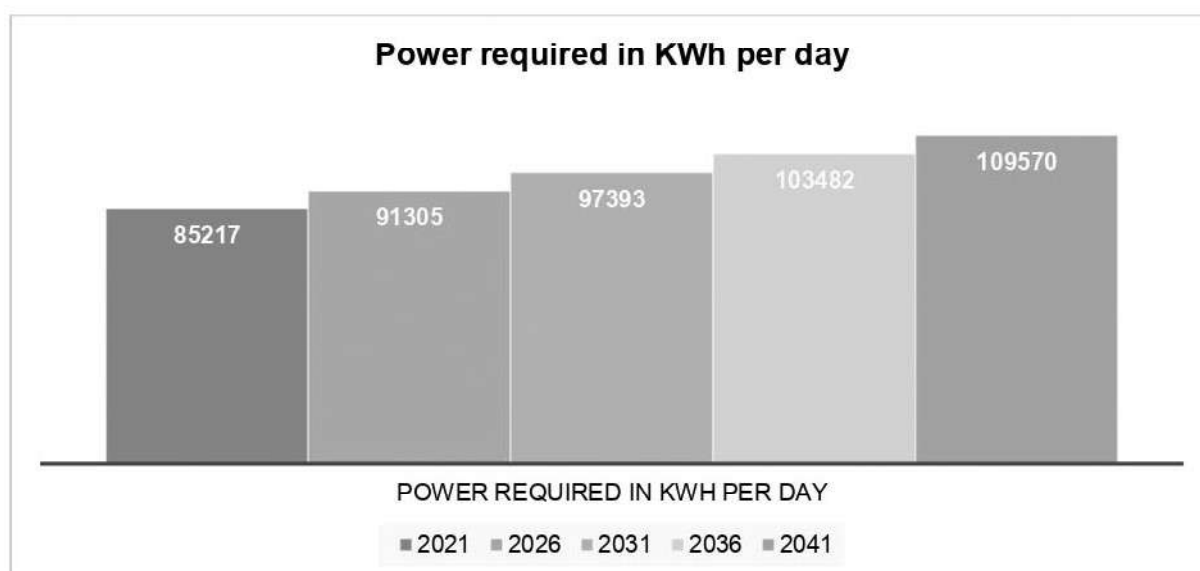


Fig. No. 7-12: Power required in KWh per day

Source: National Electrical Policy, 2005

From the above table and graph it can be seen that in 2041 around 1lac 10 thousand KWh energy would be consumed. Ass, per URDPFI, 1 electric substation of 11 KV for a population of 15000 is recommended for cities / towns, same is utilised to calculate the power demand, and substation demand. Same has been used to calculate the substation requirement for the master plan area.

Table 7-25: Requirement of Electrical Substation

1 Electric Substation of 11 KV	Population		Population Served unit	Requirement
	2011	2041		
Master Plan Area	26657	39989	15000	3

Source: Author

From the above table it is inferred that an electric substation of 33KV would be sufficient for the power need of the master plan area

7.4 Proposed Social Infrastructure

Infrastructure development is the basic foundation of an urban setting to stimulate economic growth and improve quality of life. Most advanced economies have gone through periods of intensive infrastructure building that have improved the efficiency and competitiveness of regions. For the provisions of amenities in zone, URDPFI guidelines are considered as the basis for estimation of gaps/additional requirements. For Group 3, analysis of existing and required social amenities has been done at zonal level under following categories:

- Education
- Health
- Communication Services
- Financial facilities
- Socio-Cultural amenities

7.4.1 Education facilities

Right to Education is a fundamental right in India. School is a place where children receive the first stage of formal education. Its availability and strength (in terms of number of children enrolled and dropouts) determines the literacy and economic structure of the society.

Adequacy of education facilities is assessed at master plan areal level to understand the requirement for the projected population of 2041 as per the standard mentioned in the URDPFI guidelines and development of these facilities have been mentioned in phased manner.

Table 7-26: Education Facilities available and required

Type of Education Facilities	Population Served per unit	Available	Demand	Surplus / Deficit	Phase I	Phase II	Phase III	Phase IV
					2021 - 26	2026 - 31	2031 - 36	2036 - 41
Pre-Primary school	2500	7	16	-9	2	3	3	1
Primary school	5000	29	8	21	0	0	0	0

Secondary School	7500	7	5	2	0	0	0	0
Senior Secondary School	7500	2	5	-3	1	1	1	0
College	125000	1	1	0	0	0	0	0

Source: Census 2011

The available data shows that until 2011, there is a deficit in the number of pre- primary and secondary school, the same has been addressed in Phase wise manner till 2041 in such a way that it fulfils the requirement as per the standards.

7.4.2 Healthcare facilities

The healthcare plays an important and integral role in development. In this section, existing status of health facilities and the requirement as well as the norms and standard are given for horizon year 2041. Further development of these facilities has been described at the master plan area level in a phased manner. Health centres, health sub-centres and hospitals are one of the basic requirements for any community. Primary health centre (PHCs) is the foundation of health services- a first port of call to a qualified doctor of the public sector in rural areas for unwell and those who directly report or referred from Sub-Centres for curative, preventive and primitive health care. It acts as a referral unit for Sub-Centres.

According to Census of India, 2011 data, there are 1 no. primary health centre in the master plan area and as per URDPFI guidelines the requirement till 2041 is also of 1 no only, while there is a deficit in the number of sub centre. There is a requirement of 5 sub centre till 2041 and phase wise development of these facilities has been mentioned in the table below.

Table 7-27: Health care facilities in Golakganj

Type of Health Care Facilities	Population Served per unit	Available	Demand	Surplus / Deficit	Phase I	Phase II	Phase III	Phase IV
					2021 - 26	2026 - 31	2031 - 36	2036 - 41
Primary Health Centre	30000	1	1	0	0	0	0	0
Primary Health Sub Centre	5000	3	8	-5	1	2	2	0

Source: Census 2011

7.4.3 Financial Facilities

According to URDPFI guidelines, a unit bank is required for 15,000 population and one Agriculture credit society is required for 5,000 population. Taking the above standard demand gap assessment of the financial facilities has been carried out.

Table 7-28: Financial Facilities available and required

Type of Financial Facilities	Population Served per unit	Available	Demand	Surplus / Deficit	Phase I	Phase II	Phase III	Phase IV
					2021 - 26	2026 - 31	2031 - 36	2036 - 41
Bank	15000	3	3	0	0	0	0	0
Agriculture Credit Society	5000	0	8	-8	2	3	2	1

Source: Census 2011

From the above table it can be seen that the bank is in adequate number as per the guidelines, but in the number of agricultural credit society there is a deficit of 8 number and the development of these facilities have been proposed in phase wise manner.

7.4.4 Socio-Cultural Amenities

Community centre

According to the URDPFI guidelines one unit community centre serves to 15,000 population and similarly one unit library also serves 15,000 population.

Table 7-29: Socio Cultural Amenities available and required

Type of Socio-Cultural Amenities	Population Served per unit	Available	Demand	Surplus / Deficit	Phase I	Phase II	Phase III	Phase IV
					2021 - 26	2026 - 31	2031 - 36	2036 - 41
Community Centres	15000	2	3	-1	0	1	0	0
Library	15000	0	3	-3	1	1	1	0

Source: Census 2011

There are a total 2 community centre available and as per the guideline there is a requirement of only one community centre till 2041. The same has been addressed in the table showing phase wise development of facilities. Further, it can be seen that there is a deficit of 3 number in the number of libraries required as per guidelines and the same has been addressed in a phase wise manner till 2041.

Chapter 8. Land Use Plan

Every part of land of the town to be properly protected from encroachers, use of land to be properly planned, records of land to be properly maintained in digital forms, transfer of land through buying or selling to be properly, physically inspected and recorded in Government offices, the use of land to be properly planned and owners of the land to be properly educated about the rules of use of land.

8.1 Land Use Plan

Land use refers to the use to which a particular piece of land is put and how different human activities are distributed over space. Land use involves the management and modification of natural environment or wilderness into built environment such as fields, pastures, and settlements. It also has been defined as "the arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it.

Land is the basis for most biological and human activities on the earth. Agriculture, forestry, industries, transport, housing and other services, all use land as a natural and an economic resource. Land is also an integral part of ecosystems and indispensable for biodiversity and carbon cycle.

The study of land use distribution is of prime importance for the understanding of a city structure and its growth pattern. The study of distribution of various land uses dictates the social, economic and other aspects of the growth of the city. This study aims to determine the present land use distribution of the city and thus to determine the socio-economic and physical growth of the city.

8.2 Existing Land-use divisions

Based upon extensive Land-use survey and analysis, suitable categories were given to different Land-uses as per URDPFI. The function or functions that human apply to any piece of land defines its land use. It could be a developed land of rural/urban built environment or it could be a natural environ or absolute untouched wilderness. The different types of Land-uses that could be categorized in the Existing Master Plan are:

➤ **Residential Zone**

Absolute residential areas with no major commercial or industrial zones are marked as residential.

➤ **Commercial Zone**

This zone allows a range of commercial uses including retail shops, offices, small-scale warehouses, and the hospitality industry that includes hotels and entertainment venues.

➤ **Public and Semi-Public Zone**

Health, Educational, Cultural, Government Buildings, sports and open space facilities will be allowed in this zone.

➤ **Industrial Zone**

These are the areas which typically involve industrial activities. To create a conducive environment for development Industrial Zone is created. Only industrial activities are allowed in the demarcated industrial land use.

In order to ensure that the city is an attractive and desirable place to live, a high proportion of the developable area is proposed for open spaces and recreational activities. Here recreational activities, parks, riverfront development, playground, theme parks and exhibition grounds are marked as Recreational.

➤ **Agriculture Zone**

Activities such as crop production, animal husbandry, aquaculture, agro-forestry, and horticulture are marked as land use area.

➤ **Waterbodies**

Waterbodies Zone indicates all existing waterbodies, i.e. rivers, streams, lakes, and wetlands, as indicated in the topographical sheets published by the Survey of India, the State Irrigation Department or Revenue Department or other competent authorities.

8.3 Delineation of Golakganj Master Plan Area

An area of 20 sq.km is delineated under the proposed Master Plan of Golakganj for the horizon year of 2041. Along with the existing Golakganj Municipal town area of about 5 sq.kms, an additional 14.348 sq.kms area is added from nine surrounding villages as listed below,

Table 8-1: List of villages / town in Golakganj Master Plan Area

S.No.	Name of Village/ Town	Category	Area (sqkm)
1	Ward 1	Municipal Board Area	5
2	Ward 2		
3	Ward 3		
4	Ward 4		
5	Ward 5		
6	Ward 6		
7	Ward 7		
8	Ward 8		
9	Ward 9		
10	Ward 10		
11	Dakhin Tokererchara Pt. I	Village	2.5
12	Dakhin Raipur Pt. I	Village	0.6
13	Dakhin Raipur Pt. II	Village	0.7
14	Dakhin Raipur Pt. III	Village	1.1
15	Uttar Raipur Pt. I	Village	2.7
16	Pub Gaikhowa Pt. I	Village	2.0
17	Pub Gaikhowa Pt. II	Village	1.7
18	Paschim Konuri Pt. I	Village	2.0
19	Paschim Konuri Pt. II	Village	2.0
Total Master Plan Area			20.0

Source: Census 2011

8.4 Existing Land use pattern

The area delineated for the Golakganj master plan covers 20.00 sq. kms including the municipal area of 5.00 sq. kms. The developed area covers 17 percent or 3.40 sqkm of the total Master plan area. Of this residential use covers 12 per cent of the total Master plan area.

Recreational use in the form of community centre, open fields and playgrounds cover 0.4 percent, transport infrastructure of roads and bus stop covers 2.60 per cent while

commercial use forms 1 per cent of the existing land use of the delineated master plan area.

The un-developed area of the master plan comprises about 16.60 sqkm which forms 83 per cent of the total master plan area. Much of the newly included village areas are covered with agricultural fields and bamboo groves covering all area of 14.2 sqkm. This means that nearly 85 per cent of total master plan has not been touched by any development activity. The remaining part of the un-developed area is covered by water bodies and rivers which forms 14.5 per cent, which cannot be built-upon but should be conserved.

Table 8-2: Existing Land Use

S.No.	Land Use Category	Area (Sqkm.)	Percentage of	
			Developed / Undeveloped Land	Total Master Plan Area
Developed Area				
1	Residential Use	2.4	70.6	11.8
2	Commercial Use	0.2	5.6	0.9
3	Industrial Use	0.001	0.04	0.01
4	Public &Semi-Public Use	0.2	5.9	1.0
5	Recreational Use	0.1	2.4	0.4
6	Transport & Communication	0.5	15.6	2.6
	Total Developed Land	3.4	100.0	17.0
Undeveloped Area				
7	Agriculture, Vegetation and Open Space	14.2	85.5	71.0
8	Forest	0.0	0.0	0.0
9	Water Bodies & Rivers	2.4	14.5	12.0
	Total Undeveloped Land	16.6	100.0	83.0
	Total Area	20.0		100.0

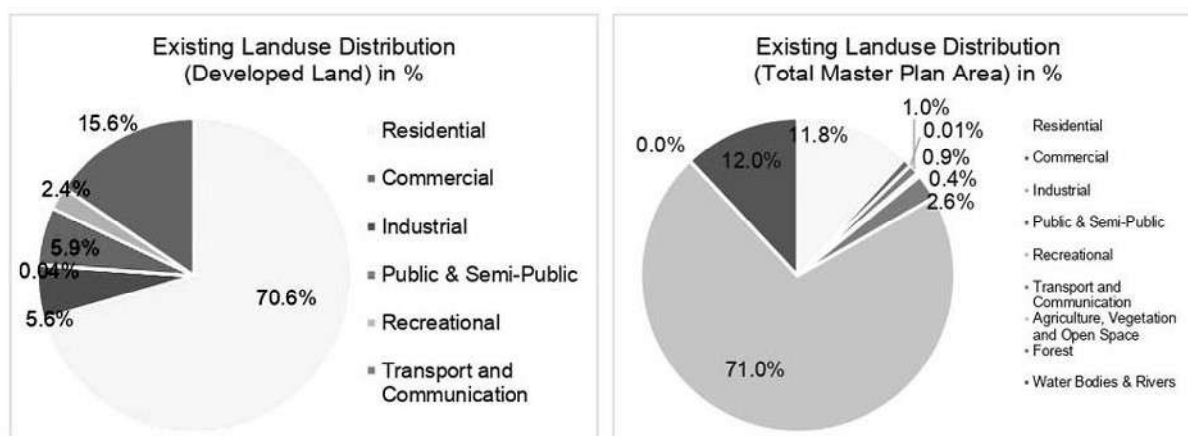


Fig. No. 8-1: Existing Landuse Distribution of Developed Land and Total Master Plan Area (in %)

Source: Author

8.5 Proposed Land use

Following the URDPFI Guidelines by the Ministry of Urban Affairs in 2015 and stakeholder discussions, the land use share is revised to adjust the projected population increase and resultant urban development.

Table 8-3: Proposed Land Use

S. No.	Land Use Category	Area (Sqkm.)	Percentage		
			Developed / Undeveloped Land	Total Master Plan Area	As per URDPFI Guidelines for small town
Developed Area					
1	Residential Use	4	51.9	19.8	45 - 50
	Settlement	1.2	15.6	6.0	
	Medium Density	2.1	27.3	10.4	
	Low Density	0.8	10.4	4.0	
2	Commercial Use	0.6	7.8	3.0	2 – 3
3	Industrial Use	0.8	10.4	4.0	8 – 10
	Home Based	0.3	3.9	1.5	
	Other Industries	0.5	6.5	2.5	
4	Public & Semi Public	1.2	15.6	6.0	6 - 8
5	Recreational Use	0.3	3.7	1.4	12 - 14
6	Transport & Communication	0.8	10.6	4.1	10 - 12

	Total Developed Land	7.7	100.0	38.2	
Undeveloped Area					
7	Agriculture, Vegetation and Open Space	9.9	80.5	49.5	
8	Forest	0	0.0	0.0	
9	Water Bodies & Rivers	2.4	19.5	12.0	
	Total Undeveloped Land	12.3	100	61.5	
	Total Area	20.0		100.0	

Source: Author

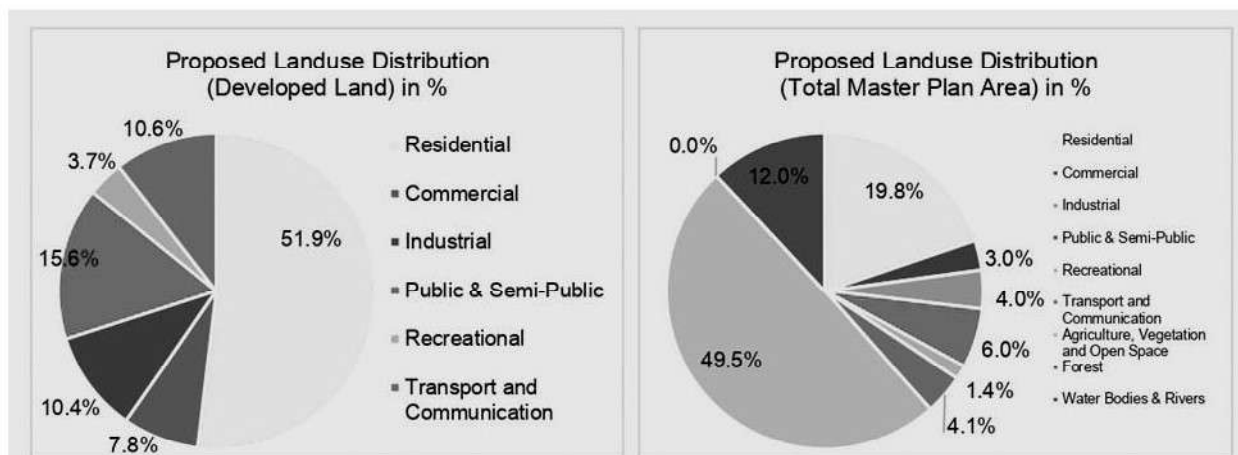


Fig. No. 8-2: Proposed Landuse Distribution of Developed Land and Total Master Plan Area (in %)

Source: Author

Table 8-4 Comparison between proposed and existing land use in Golakganj Master Plan Area

S.No.	Land use	Existing Land use Area		Proposed Landuse Area		Difference	
		(In sq.kms)	%	(In sq.kms)	%	(In sq.kms)	%
1	Residential Use	2.4	11.8%	4.0	19.8%	1.6	8.0%
2	Commercial Use	0.2	0.9%	0.6	3.0%	0.4	2.1%
3	Industrial Use	0.001	0.01%	0.8	4.0%	0.8	4%
4	Public & Semi Public	0.2	1.0%	1.2	6.0%	1.0	5%
5	Recreational Use	0.1	0.4%	0.3	1.4%	0.2	1%

6	Transport & Communication	0.5	2.6%	0.8	4.1%	0.3	1.5%
7	Agriculture, Vegetation and Open Space	14.2	71.0%	9.9	49.5%	-4.3	-21.5%
8	Forest	0.00	0.0%	0.00	0.0%	0.0	0%
9	Water bodies	2.4	12.0%	2.4	12.0%	0.0	0%
		20.0	100.0%	20.0	100.0%		

Source: Author

Chapter 9. Zoning Regulations

Zoning regulation play a very important role in controlling and promoting urban development on rational lines. They are also useful in limiting urban growth and in a broader sense can also be useful for laying down board directions of growth in a regional plan. Zoning Regulations form an integral part of any Master Plan. These have been used extensively to control development of urban areas.

Zoning Regulations also help in controlling density of development and land use in ensuring light and ventilation standards and in providing scope for future in each zone in an orderly manner.

9.1 Zoning Regulations for Golakganj Master Plan Area

Scope

- i. The Schedule lays down regulations for the use of land and building built thereon, consistent with maintaining minimum standards of density of building, protection of open spaces, sanitation and environmental hygiene.
- ii. The zoning regulations should be read in conjunction with the zones proposed in the Master Plan.

Definitions

For the purpose of these regulations, the following definitions shall apply.

- i. Words used in the present tense shall include the future, the singular number also include the plural and the plural also the singular.
- ii. "Agriculture" includes horticulture, farming, growing of crops, fruits, vegetables, flowers, grass, fodder, trees of any kind of cultivation of soil breeding and keeping of livestock including cattle, donkeys, mules, pigs, fish poultry and bees, the use of land which is ancillary to the farming of land or any other "agricultural" purpose, but shall not include the use of any land attached to the building of the purpose of a garden to be used along with such building and "Agriculture" shall be construed accordingly.
- iii. "Authority" shall mean local, regional or any other authority appointed by the State Government, the Authority in case of Municipal Areas shall be taken to mean the

Municipal Board for the area constituted under the Assam Municipal Act, 1956 (Assam Act, XV of 1957)

- iv. "Basement" shall mean the lowest floor of a building with maximum ceiling height of 2.50 with a minimum height of 1.50 mtr from ground level. Basement can be used for can parking and such other uses of the building for installation of electrical equipments, pump house etc. but not for habitation or any commercial / industrial use.
- v. "Boarding House" means a building or part of a building in which, carried on, wholly or principally the business of supply of meals to the public or a class of the public for consumption on the premises.
- vi. "Building" means any construction for whatsoever purpose and of whatsoever materials constructed and every part thereof whether used as human habitation or not and include foundation, plinth walls, chimneys, drainage work, fixed platforms, verandah, balcony or projection part of a building or anything affixed thereof or any wall enclosing or intended to enclose any land or space.
- vii. "Building of Accessory Use" means a subordinate building use of which is incidental to that of a principal building on the same plot such as garage, coal or woodshed, guard room, power installation, pump house etc.
- viii. "Building Height of" means the vertical distance measured in the case of flat rooms from the average level of the centre line of the adjoining street to the highest point of the building adjacent to the street wall and in the case of pitched roofs, up to the point where the external surface of the outer wall intersects the finished surface of sloping roof in the case of gates facing the road, the mid-point between the eaves level and the ridges Architectural features serving no other function except that of decoration shall be excluded for the taking heights. If the building does not abut on a street the height shall be measured above the level of the ground and contiguous to the building.
- ix. "Building Set Back" means the distance by which any building or structure shall be separated from the boundary lines of the plot.
- x. "Commerce" means carrying on any trade, business or profession, sale, exchange of goods of any type whatsoever and includes the running of, with a view to make profit, nursing homes, vocational educational institutions and also includes hotels, restaurants, boarding house not attached to any educational institution and "Commercial" Shall be constructed accordingly.

- xi. "Commercial Use" includes the use of any land or building or part thereof, for purposes of commerce as defined or for storage of goods, or as an office, whether attached to industry or otherwise.
- xii. "Coverage" is the percentage ratio of the plinth area of the main and necessary building to the total area of plot.
- xiii. "Customary Home Occupation" means occupation other than that of an eating or drinking place offering services to the general public carried on by a member of the family residing on the premises and in accordance with which there is no display that will indicate from the exterior that the building utilized in whole or in part of any purpose other than that as a dwelling and in connection with which no article or service is sold or held up for sale except that produced by a member of the family residing on the premises and no mechanical equipment is used except as is customary for purely domestic or household purpose.
- xiv. "Development" means the carrying out of building engineering, mining or other operation in, on or over the level, of making material change in the use of any building or of land:
- xv. Provided that the following operations or uses of land shall not be deemed for the purposes of this regulation to mean development of the land that is to say:
 - a. The carrying out of works for maintenance, improvement or other alternative of any building which effect only the interior of the building or which do not materially affect the use and the external appearance of the building;
 - b. The carrying out by a local authority of any works required for maintenance or improvement of road, works carried out on land within the boundaries of the road;
 - c. The carrying out by a local authority any works for the purposes of inspecting repairing or renewing any sewers, main pipes, cables or other apparatus, including the breaking open of any street or other land for that purpose;
 - d. The use of any building or other land within the curtilage of a dwelling house for any purpose incidental to the enjoyment of the dwelling house as such.
- i. "Development Scheme" means a development scheme and includes a plan together with the descriptive matter if any relating to such a scheme.
- ii. "Dwelling" means a building or a portion thereof, which is designed or used wholly or principally for residential purposes. This shall not include boarding or rooming

houses, tents, tourist camps, hotels or other structures designed or used primarily for transit residents.

- iii. "Floor Area Ratio (FAR)" means the quotient obtained by dividing the total covered area (plinth area) of all floors and 100 by the area of the plot.

$$\text{FAR} = \frac{\text{Total covered area of all floors} \times 100}{\text{Total plot Area.}}$$

- iv. "Green Belt Zone" means the area in the periphery of the Master Plan Area to restrict normal urban expansion.
- v. "Ground Level" means the height of the central line of the adjoining developed road.
- vi. "Hotel" means a building or part of a building used for boarding and lodging purposes.
- vii. "Industry" includes the carrying of any manufacturing process as defined in factories Act. 1948 and "Includes" shall be construed accordingly.
- a. "Industrial Use" includes the use of any land or building or part thereof for Industry as defined.
- b. Industry, Clean" means industries which do not throw out any smoke, noise, offensive odor or harmful industrial wastes and employing not more than 10 workers with or without power.
- c. "Industry, Light" means industry which do not throw out excessive smoke, noise offensive odor of harmful wastes, employing not more than 100 workers and using power of not more than 100 HF, such industries except in the case of foundries and smithies do not consume and solid fuel.
- d. "Industries, Medium" includes industries which employ more than 100 workers and any use any kind of motive power or fuel, subject of course to noxious features. Factories which are classified as heavy industries under the Factories act, 1948, do not come under this category.
- e. "Industry obnoxious" are those industries which are associated with such as excessive smoke, noise, vibration stench, unpleasant or injurious fumes, effluents, explosive, inflammable industries etc. and not such other which are hazardous to health and safety of the community.
- f. "Industry obnoxious" are those industries which are associated with such as excessive smoke, noise, vibration stench, unpleasant or injurious fumes, effluents, explosive, inflammable industries etc. and not such other which are hazardous to health and safety of the community.

- g. "Mezzanine" means an intermediate floor in between two main floors having maximum height of 2.20 Mtr. and minimum height of 1.80 Mtr. from the floor and having proper access to it. A mezzanine floor must not cover more than third floor area of the Ground floor.
- i. "Non-conforming building or use" includes a building, structure or use of any land existing at the time of commencement of those regulations and which do not conform to the regulations pertaining to the zone in which it is situated.
- ii. "Occupier" Includes:
 - a. A tenant;
 - b. An owner in occupation of, or otherwise using his land;
 - c. A rent-free tenant of any land;
 - d. A licensee in occupation of any land, and
 - e. Any person who is liable to pay to the owner damages for the use and occupation of any land.
- iii. "Open Space" means any land whether enclosed or not of which not more than one twentieth part is covered with building and whole of the remainder has been laid out as a public or used for purpose of recreation or lies waste and unoccupied.
- iv. "Owner" includes a mortgagee in possession, a person who for the time being is receiving or is entitled to receive, the rent or premium for any land whether on his own account or on behalf or for the benefit to any other person or as an agent, guardian or for any other person or for religious or charitable institution, or who would so receive the rent or premium if the land were let to a tenant, and includes the head of a Government Department, General Manager of a Railway, the Secretary or other Principal Officer of a local Authority, Statutory Authority or Company, in respect of properties under respective control.
- v. "Parking Space" means an area enclosed or unenclosed sufficient in size to store an automobile or any other conveyance together with a drive way connecting the parking space with a street or alley and permitting ingress or egress to all such conveyances.
- vi. "Plinth" means the portion of a structure between the surface of the surrounding ground and surface of the floor, immediately above the ground.
- vii. "Plot" means a piece of land occupied or intended to occupy by a main building or use together with its accessory building and uses customary and incidental to it,

including the open space required by those regulation and having frontage upon a private way that has officially being approved by competent Authority.

- viii. "Prescribed" means prescribed by rules and regulations under the Assam Town & Country Planning Act, 1959 (as amended).
- ix. "Prescribed street Line" means the line on one or both sides of any road or street prescribed in the master plan or by the authority showing the proposed site limits of the road or street.
- x. "Public and Semi-Public Place" means any place or building which is opened to use and enjoyment of the public, whether it is actually used or enjoyed by the public or not, and whether the entry is regulated by any charge or not.
- xi. "Repairs" means any renovation applied to any structure which does not in any way change the specification of the structure but saves the structure from further deterioration.
- xii. "Residence" includes the use for habitation of any land or building or part thereof, includes garden, grounds, garage, stables and out houses, if any appertaining to such building and residential shall be constructed accordingly.
- xiii. "Road and Street" means any Highway, street, Pathway, Alley, Stairway, Passageway, Carriageway, foot way, Square place or bridge, whether a thoroughfare or not over which the public have a right or passage or access or have passed and had access uninterruptedly for a specified period, whether existing or proposed in any scheme and includes all bunds, channels, ditches, storm water drains, culverts, sidewalk, traffic island, roadside trees and hedges, retaining walls, trench barriers and railway, within the road line.
- xiv. "Shop Line" means shops when allowed irrespective of any zone in between the space of the prescribe street line and line drawn parallel to the street which is demarcated as shop line. The maximum depth of shop line should not be more than 6 meters.
- xv. "Site" the portion of a building included between the surface of the floor and surface of the floor next above it or if there is no floor above it, then the space between any floor and ceiling next above, it when measured, the height of a habitable basement extending at least 5 feet above ground level or a habitable attic shall be counted as storey.

- xvi. "Structure" means any combination of material including building constructed or erected the use of which requires location the ground including among other things signboards, fences and wall that are more than three feet height.
- xvii. "To Abut" means to abut on a road such that any portion of the building is on the road boundary.
- xviii. "To construct" means to create, re-create, make material alteration.
- xix. "To create" means construct a building for the first time or to reconstruct existing building after demolishing it according to some fresh or revised plans.
- xx. "Total Floor Area" means the area of all floors a building including habitable attics.
- xxi. "To make material alteration" means to make any modification in any existing building by way of an addition or alteration or any other change in the roof, window and door, compound, sanitary and drainage system in any respect whatsoever. Opening of a window and providing inter communication door shall not be considered as materials alteration. Similarly, modification in respect of gardening and white washing, painting. Retailing and other decorative works shall not be deemed to be material. It further includes.
 - a. Conversion of building or a part thereof for human habitation as one dwelling house into more than one dwelling house and vice versa.
 - b. Conversation of a building or a part thereof suitable for human habitation into dwelling house or vice versa.
 - c. Conversion of a dwelling house or a part thereof into a shop warehouse or factory or vice versa; and
 - d. Conversion of building used or intended to be used for one purpose such as shop, warehouse, or factory etc. into one or another purpose.
- xxii. "To re-erect" means to construct for a second time or subsequent times a building or a part of building after demolishing it one the same plan as has been previously mentioned.
- xxiii. "Water course" means a natural channel or an artificial one formed by draining or diversion or a natural channel means for carrying storm water either from a single property or several properties draining thereto in combination.
- xxiv. "Warehouse" means a building, the whole or substantial part or which is used or intended to use for storage of goods whether for keeping or for sale for any similar purpose but does not include storeroom matched to, and used for the proper functioning of a shop.

- xxv. "Yard" means an open space on ground level between a building and the adjoining boundary line of the plot unoccupied and unobstructed except by encroachments or structures specifically permitted by those bylaws on the same plot with a building. All Yards measurements shall be the minimum distance between the front, rear and side yard and plot boundaries, as the case may be and the nearest point of the building including enclosed and covered porches. Every part of every yard shall be accessible from every other part of the same yard.
- xxvi. "Yard Front" means a yard extending across a front of a plot between the side lines and being the minimum horizontal distance between the street line and the main building and any projection thereof other than steps, unenclosed balconies and unenclosed porches.
- xxvii. "Yard rear" means a yard extending across the rear a plot boundary and being the minimum horizontal distance between the rear plot boundaries and the rear of the building or any other projection, other than steps, unenclosed balconies and unenclosed porches. In a corner plot rear yard shall be considered as parallel to the street upon which the plot faces and the rear yard shall be at the opposite end of the plot from the front yard.
- xxviii. "Yard side" means a yard between the building and the side line of the plot and extending from the front line to the rear line of the plot and being the minimum horizontal distance between the said boundary line and the side of a building or any other projection other than steps.
- xxix. The definition of the term which is not covered by this regulation shall be covered by the definition prescribed by the Assam Town and Country Planning Act and the rules framed there under.

General Regulations:

- i. The requirements of these Regulation within each zone shall be the minimum requirement and shall apply uniformly to each class and each kind or structure or land except as herein and after provided.
- ii. No building, structure and land shall hereinafter be used or occupied and no building or structure or part of the building or structure or part of the building shall hereinafter be erected, re-erected or materially altered unless in conformity with all of the regulations herein specified for the zone in which it is located.
- iii. No building or any other structure shall hereafter be erected or materially altered:

- to exceed the height;
 - to accommodate on a house a greater number of families;
 - to occupy a greater percentage of plot area;
 - to have narrower or smaller rear yard, front yards, other open space than herein required or in any other manner contrary to provision of these regulations.
- iv. Non-conforming plots, non-conforming use of land, non-conforming structure and non-conforming use of structure and premises.
- v. Within the zones established by these regulations or amendments that may later be adopted therein, existing plot structure and use of land and structure which were lawful before regulations came in force or were, amended, but which would be
- vi. Prohibited, regulated, or restricted, under the terms of these regulations or future amendments, shall be permitted to continue until they are removed. Such uses are declared by these regulations to be incompatible with permitted uses in the zone.
- a. A non-conforming use of a structure, non-conforming use of land, or a non-conforming use of a structure and land shall not be extended or enlarged after coming in to force of these regulations by attachment on a building premises of additional sign intended to be seen from the premises, or by the addition of the other uses of a nature which would be prohibited generally in the zone involved.
- b. Nothing in these regulations shall be deemed to require a change in the plan, construction, or designated use of any building on which actual construction was lawfully begun prior to the coming into the force of this regulation has been differently carried on. Actual construction hereby defined to include the placing of construction materials in permanent position and fastened in a permanent manner; except that where demolition or removal shall be deemed to be actual construction provided that work shall be diligently carried on until completion of the building involved.
- c. Non-conforming uses of land where, on the date of coming into force of these regulations or amendments thereto lawful use of land exists that is made no longer permissible under the terms of these regulations as enacted or amended, such use may be continued, so long as it remains otherwise lawful, subject to the following provisions: